No. 126, Original

In The

Supreme Court of the United States

STATE OF KANSAS,

Plaintiff,

v.

STATE OF NEBRASKA

and

STATE OF COLORADO,

Defendants.

REPORT OF THE SPECIAL MASTER

WILLIAM J. KAYATTA, JR.
Circuit Judge
Sitting as Special Master
156 Federal Street
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November 15, 2013

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GLOSSARY

BCU	Beneficial Consumptive Use
CBCU	Computed Beneficial Consumptive Use
DNR	Nebraska Department of Natural Resources
FSS	Final Settlement Stipulation
IMP	Integrated Management Plan
IWS	Imported Water Supply
KBID	Kansas Bostwick Irrigation District
NASS	National Agricultural Statistics Service
NBID	Nebraska Bostwick Irrigation District
NYA	Normal Year Administration
NRD	Natural Resource District
RRCA	Republican River Compact Administration
VWS	Virgin Water Supply
WSYA	Water-Short Year Administration

I. INTRODUCTION

In this original action, Kansas seeks a remedy both for Nebraska's breach in 2006 of the 1943 Republican River Compact and for what Kansas claims is Nebraska's likely continued breach of that Compact in the future. Kansas argues that Nebraska's conduct also violates a prior decree of the Court approving an earlier settlement among the parties. Nebraska, in turn, both opposes Kansas' claims and asserts a counterclaim seeking to correct what it claims is a mistake in the accounting procedures used under the terms of that earlier settlement agreement.

The Court appointed me Special Master with direction to, among other things, direct the course of proceedings, take evidence, and submit reports as I deemed appropriate. After issuing a series of case management orders directing the filing of pleadings and the conduct of discovery, after holding testimonial hearings on all claims, and after receiving full briefing and argument, including comments on a draft of this Report, I now submit this Report to the Court. The Report identifies the issues before the Court, discusses the states' contentions concerning those issues, describes the evidence and law pertinent to the resolution of those issues, and sets forth recommendations for the Court. The recommendations address all claims in this action. If accepted, they allow the Court to enter judgment in this action disposing of all claims and defenses asserted in this action.

Generally summarized, the Report recommends that the Court declare Nebraska to have breached the 1943 Compact by consuming a total of 70,869 acre-feet of water in excess of its Compact allocation in 2005 and 2006; that the Court enter judgment against Nebraska and in favor of Kansas in the amount of $5,500,000; that the Court otherwise deny Kansas' claims for relief; and that the Court order the accounting procedures used by the states reformed to correct a mistake. A proposed Decree embodying these recommendations accompanies this Report as Appendix A.

II. BACKGROUND

A. The Compact

In 1943, Congress approved the Republican River Compact (the "Compact"), an agreement among the states of Kansas, Nebraska and Colorado apportioning among themselves the waters of the Republican River Basin (the "Basin"). *See* Act of May 26, 1943, ch. 104, 57 Stat. 86.[1] The Republican River rises in Colorado, crosses the northwestern tip of Kansas into Nebraska, and then runs through Nebraska before re-entering north-central Kansas. Together with its many tributaries, it drains a 24,900 square mile watershed between the North Platte River to the

[1] The Compact is included with this Report as Appendix B. A map of the Basin is included as Appendix C.

north and the Arkansas River to the south. (K80 at KS1306.)[2] Roughly 430 miles long and sparsely populated (*id.*), the Basin itself encompasses an active agricultural region producing, among other things, corn, soybeans and milo (N8208 at 5-6). Over 1.8 million acres of land in the Basin are irrigated with the benefit of either diverted river flow or groundwater pumping. (K80 at KS1574.)

The Compact is simple and concise. It defines the Basin's average annual "Virgin Water Supply" to be "the water supply within the Basin undepleted by the activities of man." *See* Compact art. II.[3] It estimates

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[2] Citations to "K___," "N___," "C___," and "J___" are, respectively, citations to exhibits admitted into evidence upon proffer by Kansas, Nebraska, Colorado, or all parties jointly. Page references in exhibit citations refer to the internal pagination of the cited documents, except where it is more helpful to use the Bates numbers assigned by the parties. In such cases, I omit the series of zeroes at the beginning of most page numbers (so that KS000000456 becomes KS456). A list of all admitted exhibits can be found on the docket at entry 504. The exhibits themselves are maintained in the Special Master's file. The docket and electronic copies of all public filings included therein are accessible on the internet at http://media.ca1.uscourts.gov/special_master/. A hard copy of the docket sheet itself, as of October 16, 2013, is attached to this Report as Appendix D. Citations to "Dkt. No. ___" are citations to filings included in the docket.

[3] For ease of reading, and without any change in meaning, this Report generally uses shorter, uncapitalized terms such as "virgin water," "use" (or "consume"), and "imported water," rather than the capitalized terms "Virgin Water Supply," "Beneficial Consumptive Use," and "Imported Water Supply," except where the context otherwise requires.

that Virgin Water Supply to average 478,900 acre-feet[4] of water per year. *Id.* art. III. (*See* Second Report of the Special Master at 12 & n. 30, *Kansas v. Nebraska*, No. 126 Orig. (Apr. 15, 2003) (hereinafter "Second Report") (noting that the Virgin Water Supply in the Basin was determined by finding the average of the "aggregate virgin water supply over an eleven year period").) It then allocates to each state its agreed-upon share of that Virgin Water Supply annually "for beneficial consumptive use." Compact art. IV. "Beneficial Consumptive Use" is defined as "that use by which the water supply of the Basin is consumed through the activities of man." *Id.* art. II. The Compact contains no provisions for dispute resolution, nor does it address the myriad of details necessary for its administration. Rather, in Article IX, it calls for each of the states to administer the Compact through an official charged with administering public water supplies, and it acknowledges that those three officials can by unanimous action adopt rules and regulations consistent with the Compact. *See id.* art. IX. By regulations adopted in 1959 pursuant to Article IX, the states established the Republican River Compact Administration ("RRCA"). (J3 at JT1154.) The three members of the RRCA by unanimous action compute each year the Virgin Water

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[4] An acre-foot is the amount of water required to cover one acre one foot deep, and is the equivalent of 43,560 cubic feet or 325,851 gallons.

Supply within the Basin, and the Beneficial Consumptive Use of each state.

B. The Prior Dispute

Original Action No. 126 commenced on January 19, 1999, when the Court granted Kansas' motion for leave to file a bill of complaint. *Kansas v. Nebraska*, 525 U.S. 1101 (1999). The principal cause of that action was "the proliferation and use of thousands of wells hydraulically connected to the Republican River and its tributaries. " (Kansas Bill of Complaint at ¶ 7, *Kansas v. Nebraska*, No. 126 Orig. (May 26, 1998).) In brief, Kansas maintained that, to the extent groundwater pumping depleted stream flow in the Basin, it constituted consumption that must be counted against the allocated share of the pumping state. Nebraska maintained to the contrary.

At the Court's invitation, Nebraska filed a motion to dismiss in order to test Kansas' assertion that groundwater pumping was subject to the Compact allocation limits to the extent the groundwater pumping depleted stream flow. *Kansas v. Nebraska*, 527 U.S. 1020 (1999). The Court appointed the Honorable Vincent L. McKusick as Special Master and referred the motion to him. *Kansas v. Nebraska*, 528 U.S. 1001 (1999). Nebraska's position on the motion turned out to be largely without basis. As Special Master McKusick observed, "the language of the Compact is not ambiguous. A straightforward reading of its terms yields the conclusion that a State's groundwater

pumping, to the extent it depletes stream flow in the Basin, is intended to be allocated as part of the virgin water supply and to be counted as consumptive use by the pumping State." (First Report of Special Master at 23, *Kansas v. Nebraska*, No. 126 Orig. (Jan. 28, 2000) (hereinafter, "First Report").) The extrinsic evidence reinforced the conclusion that there was "an unambiguous intention to include in the measurement of virgin water supply all the natural stream flow in the Basin, including that depleted by groundwater pumping of any kind." (*Id.* at 34.) Following Nebraska's lodging of exceptions to the Special Master's Report, the Court denied Nebraska's motion to dismiss and recommitted the case to Special Master McKusick for further proceedings. *Kansas v. Nebraska*, 530 U.S. 1272 (2000).

The parties thereafter entered into settlement discussions aimed primarily at determining how best to ascertain and reflect in Compact accounting the depletion of stream flows in the Basin arising from groundwater pumping throughout the Basin, as well as the impact on stream flows in the Basin of water supplies imported by the states into the Basin. On December 15, 2002, the parties executed a "Final Settlement Stipulation" ("FSS"), subject to approval by the Court. (*See* Second Report at 22-26.)

In its May 19, 2003, Decree, the Court "approved" the FSS and recommitted the action to Special Master McKusick "for the sole purpose of deciding procedural questions arising from the completion [of a groundwater model]." *Kansas v. Nebraska*, 538 U.S.

720 (2003). The groundwater model was thereafter successfully completed and adopted by the parties, as certified in the Final Report of Special Master McKusick. (Final Report of Special Master, *Kansas v. Nebraska*, No. 126 Orig. (Sep. 17, 2003) (hereinafter, "Final Report").)

C. The Final Settlement Stipulation

The five-volume FSS,[5] which expressly did not purport to alter the fourteen-page Compact (*see* FSS at § I.D), resolved certain matters of Compact interpretation and enforcement and provided detailed mechanisms for determining future compliance. (*See* Second Report at 2; *see also id.* at 45 (noting that the litigation was "at least as much about ensuring compliance in the future as it [was] about damages for past violations").) Much of the detail and complexity inherent in the FSS arose from the need to account for and attribute to the respective states the impacts on stream flow of groundwater pumping from over 18,000 wells within the Basin. (*See* Final Report at 18.) The FSS secured for all parties the practical tools for future administration of the Compact, including

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[5] The narrative text of the FSS is included as Appendix E to this Report for ease of reference. The entirety of the five-volume FSS, and the groundwater model agreed upon pursuant to its terms, are attached to Special Master McKusick's Second Report, dated April 15, 2003, and to his Final Report dated September 17, 2003, respectively. The FSS also appears at Exhibit J1 in these proceedings.

its application to the complex hydrology of groundwater pumping. These tools consisted primarily of the RRCA Accounting Procedures ("Accounting Procedures") and the RRCA Groundwater Model ("Groundwater Model"), enabling a comprehensive resolution of the dispute that would have likely proved to be difficult to secure by litigation without great uncertainty, expense, and protracted delay. (*See* Second Report at 34-35.) The states also waived their claims under the Compact with respect to activities and conditions occurring prior to December 15, 2002. (FSS at § I.D.)

The FSS provides that compliance with the Compact's allocation limits is determined based on multi-year running averages in order to smooth out year-to-year deviations and to provide the parties with increased flexibility. The FSS provides for the use of a five-year running average for "Normal Year Administration" purposes, and a two-year running average for "Water-Short Year Administration." (FSS at §§ IV.D, V.B.2.e.i.) Either 2006 or 2007 was stipulated to be the first year for ascertaining compliance, depending on whether Water-Short Year Administration was in effect in 2006 (*see* FSS app. B), which turned out to be the case.[6]

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[6] "Water-Short Year Administration" is in effect when irrigation supply stored in Harlan County Lake in south-central Nebraska, the principal reservoir for points downstream, is projected to fall below a specified level. FSS § V.B.1.a.

While Nebraska concedes that it failed its first compliance test in 2006, the parties dispute how the precise extent of Nebraska's non-compliance should be measured. (*See* Stipulation of the States Concerning Accounting of Overuse by Nebraska, *Kansas v. Nebraska*, No. 126 Orig. (Sep. 16, 2011) (Dkt. No. 96) (hereinafter "Stipulation of Overuse").) The parties also dispute the remedy to be granted.

III. KANSAS' PETITION

The Court's docket in Original Action No. 126 remained dormant from 2003 until May 3, 2010, when Kansas filed a Motion For Leave To File Petition, Petition, And Brief In Support. In the petition accompanying its motion, Kansas alleged that it had been "damaged by Nebraska's violation of the Compact and the Decree. " (Petition at ¶ 22, *Kansas v. Nebraska*, No. 126 Orig. (May 3, 2010) (Dkt. No. 1) (hereinafter "Petition").) The Petition alleged an overuse of water in the amount of approximately 79,000 acre-feet during 2005 and 2006, combined. (*Id.* at ¶ 19.) As a remedy, Kansas asked the Court to hold Nebraska in contempt for violating the May 19, 2003, Decree, to enjoin further violations, to order Nebraska to pay Kansas the greater of Nebraska's gain or Kansas' loss resulting from the violation, to set predetermined sanctions for future violations, to order Nebraska to curtail groundwater pumping or take other equivalent action, and to appoint a river master, all in addition to such other relief as might be just

and equitable, plus an award of fees and costs. (*Id.* at 11-12.)

In response, Nebraska contended that Kansas' claims, on their own, were of insufficient significance to warrant further proceedings before the Court, but that those claims, combined with other related issues Nebraska would raise, justified the Court's attention. (*See* Brief of State of Nebraska In Response To Kansas' Motion For Leave To File Petition at 18, *Kansas v. Nebraska*, No. 126 Orig. (July 1, 2010) (Dkt. No. 2).)

By order dated April 4, 2011, the Court granted Kansas' motion for leave to file a petition. The Court appointed me "to fix the time and conditions for the filing of additional pleadings, to direct subsequent proceedings, to summon witnesses, to issue subpoenas, and to take such evidence as may be introduced and such as he may deem it necessary to call for." *Kansas v. Nebraska*, 131 S. Ct. 1847 (2011).

IV. THE COURSE OF PROCEEDINGS BEFORE THE SPECIAL MASTER

The course of proceedings before me commenced with a telephone call with counsel for the parties and the United States[7] on April 22, 2011, and concluded

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[7] The United States has participated only as *amicus curiae*, and has not actively participated during discovery, briefing, and trial. (*See* United States' Statement of Participation, *Kansas v. Nebraska*, No. 126 Orig. (May 31, 2011) (Dkt. No. 25).)

with a final telephone conference with the parties on October 18, 2013, followed by a joint submission of the states. The completion of the pleadings, the conduct of discovery, the filing and resolution of numerous motions, and the conduct of evidentiary hearings proceeded in accordance with a series of Case Management Orders and a Case Management Plan, as reflected on the docket.

Nebraska filed its answer and counterclaim on May 31, 2011. At the outset of discovery I allowed Nebraska to file an amended answer with counterclaims and crossclaims, pursuant to which it sought a Court-ordered change to the RRCA Accounting Procedures which, if adopted, would affect the determination of the amount of water used in 2006 (and thereafter). (*See* Case Management Order No. 2 [Corrected] at ¶ 1.1 (Aug. 9, 2011) (Dkt. No. 72).) I also required the parties to file initial briefs explaining their respective positions on certain legal issues likely to frame discovery and development of the factual record. (Case Management Order No. 1 at ¶¶ 2.2, 2.3 (Apr. 28, 2011) (Dkt. No. 9).) Over the course of the ensuing year, I allowed the parties to conduct written discovery and depositions in accord with a version of the Federal Rules of Civil Procedure modified to best fit this particular action. (*See* Case Management Plan at ¶ 5 (Apr. 28, 2011) (Dkt. No. 10).) At the conclusion of that discovery, the parties filed four motions for one form or another of partial judgment. (*See* Dkt. Nos. 212-15.) I reviewed and considered all of those motions, discussed them with

counsel, and took them under advisement pending the determination of related issues and the facts following a full hearing. During this process, I shared with counsel my preliminary thinking on various issues raised by their motions in order to guide and sharpen subsequent presentations and argument.

Commencing on August 13, 2012, and concluding on August 23, 2012, I conducted an evidentiary hearing on all outstanding claims and defenses. At the request of all three parties, the evidentiary hearing was held in the United States District Courthouse located in Portland, Maine. The procedure for the presentation of testimonial evidence and exhibits was as follows:

First, the direct testimony of all witnesses except hostile witnesses was pre-filed in writing during the four weeks prior to commencement of the hearing. Twenty-one different witnesses, eleven of whom were experts, submitted over 550 pages of pre-filed testimony, all of which I reviewed before the hearing commenced.[8]

Second, I allowed each of the parties to file as exhibits the written reports of their testifying experts. Seventeen such reports, totaling over 600 pages, were filed. I also reviewed these reports before the hearing commenced.

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[8] In this Report, pre-filed testimony is cited as "[Witness] Direct at ___." All pre-filed testimony can also be found on the docket.

Third, the parties were allowed to submit objections to any pre-filed testimony or expert reports. Because there was no jury, I discouraged the filing of so-called *Daubert* motions. Simply put, it made the most sense to hear the expert testimony and to determine whether or not it was relevant and persuasive, thereby mooting any need to make the more refined determination of whether it was so inadequate as to be inadmissible. The parties nevertheless collectively filed eighteen motions *in limine*, primarily but not exclusively on *Daubert* grounds (*see* Dkt. Nos. 314-26, 334-36, 338, 356), all of which I reviewed and took under consideration, ultimately denying all the *Daubert* motions on the merits to the extent I relied on any expert testimony in my findings, or otherwise as moot.

Fourth, at the hearing each witness was called to the stand to affirm and offer his pre-filed testimony. At that point, I heard and ruled on any standard evidentiary objections to such testimony.

Fifth, each party tendered its witnesses for cross-examination, followed by re-direct and re-cross if desired. At the conclusion of counsel's questioning, I then asked such questions of the witnesses as seemed necessary and appropriate to better understand the testimony offered by the witness. Live testimony was presented in this manner by twenty-one witnesses over the course of nine days.

Thereafter, the parties filed extensive post-trial briefs and reply briefs. After reviewing these briefs

and the accumulated record, I circulated to counsel a draft report for comment. (*See* Case Management Order No. 8, *Kansas v. Nebraska*, No. 126 Orig. (Jan. 9, 2013) (Dkt. No. 415).) I conducted a non-testimonial hearing on January 24, 2013 to hear argument related to the draft report. Following that hearing, I issued Case Management Order No. 9, *Kansas v. Nebraska*, No. 126 Orig. (Jan. 25, 2013) (Dkt. No. 431). In that order, I set a schedule for further discovery, the submission of supplemental expert reports, and a hearing targeted at several arguments Kansas pressed concerning Nebraska's counterclaim. That hearing was held and concluded on August 15, 2013, also in Portland, followed by post-hearing briefing and a final telephone conference with the parties on October 18, 2013.

V. STATEMENT OF THE ISSUES

The pleadings, the evidence, and the arguments advanced on behalf of the parties pose three basic questions for the Court: Should the Court reform the RRCA Accounting Procedures to correct what Nebraska and Colorado contend is a mistake in those procedures? By what amount of water did Nebraska fail to meet the applicable 2006 compliance test? And what is the remedy to which Kansas is entitled as a result? Answering these three questions requires resolution of the following issues:

A. The Accounting Procedure Issue

All parties agree that the virgin water supply of the Republican River Basin does not include water that finds its way into the Basin as a result of man-made diversions from the Platte River Basin. The states refer to this water as "Imported Water Supply." Under certain dry conditions, the RRCA Accounting Procedures nevertheless interact with the Groundwater Model to treat the consumption of imported water as if it were the consumption of the virgin water of the Republican Basin. The amount of imported water treated in this manner varies from year to year. For the year 2006, the current Accounting Procedures treat approximately 8,000 acre-feet in this manner. Nebraska seeks a court order modifying the RRCA Accounting Procedures to eliminate this treatment on the grounds that it mistakenly conflicts with the FSS and with the Compact itself. Kansas argues that the Court cannot change the agreed-upon RRCA Accounting Procedures without the consent of all parties and that, in any event, the precise changes Nebraska seeks are otherwise inappropriate. For the reasons stated below, Nebraska has proven that the current RRCA Accounting Procedures do indeed contain a technical mistake that can be equitably reformed in the manner described in this Report for accounting years 2007 forward.

B. The Harlan County Lake Evaporation Issue

Each year water is stored in Harlan County Lake for release during irrigation season to the Nebraska Bostwick Irrigation District ("NBID") through the Superior Canal and to the Kansas Bostwick Irrigation District ("KBID") through the Courtland Canal. Some of the water stored in the reservoir is lost to evaporation, which the FSS deems to be a Beneficial Consumptive Use of the water. For 2006, the amount of that evaporative "use" was just over 16,000 acre-feet. The FSS allocates this evaporation to Kansas and Nebraska in proportion to the amount of the annual diversions made by NBID and KBID during the time when irrigation releases are being made from Harlan County Lake. During 2006, in an effort to reduce the extent of its over-consumption of water, Nebraska chose not to divert to NBID any of the reservoir releases, and thus claims no responsibility for any of the evaporative losses from the reservoir that year. Kansas contends that Nebraska should still be held responsible for a share of that evaporative loss, either under a related accounting convention, or because not using the water in order to achieve Compact compliance should be deemed the equivalent of diverting the water. For the reasons stated below, Nebraska should not be liable for evaporative losses from Harlan County Lake during 2006.

C. The Non-Federal Reservoir Evaporation Issue

The parties disagree about whether evaporation from certain Non-Federal Reservoirs located in Nebraska was properly deemed to be a Beneficial Consumptive Use of water by Nebraska, a purely legal question. Kansas insists that such evaporation is a Beneficial Consumptive Use chargeable to Nebraska, and therefore includes the evaporation in calculating the extent of Nebraska's overuse of water in 2005 and 2006. In response, Nebraska waives any challenge to Kansas' position as far as the accounting for 2005 and 2006, but asks that the Court leave the issue open and unresolved for future years. For the reasons stated below, this action provides a suitable occasion for resolving this dispute by declaring that evaporation from the Non-Federal Reservoirs located in Nebraska is a Beneficial Consumptive Use of water by Nebraska.

D. The Average Overuse Versus Total Overuse Issue

In order to determine whether Nebraska exceeded its Compact allocation in 2006, one must calculate for each of 2005 and 2006 the difference between allocation and usage minus any credits, and then take the average of the results. (*See* FSS app. C at C65, Table 5C.) The parties agree that Nebraska exceeded its annual allocation in both 2005 and 2006. (*See* Stipulation of Overuse.) Nebraska argues that it is liable for an amount of water that equals the

average of the two annual exceedances. Kansas argues, instead, that Nebraska is liable for the full, cumulative exceedance for the two years combined. For the reasons stated below, Nebraska's damages for its violation in 2006 should be measured by its entire overuse in the 2006 compliance period (2005 and 2006).

E. The Contempt Issue

Kansas seeks a finding of contempt based on an argument that Nebraska has violated the Court's May 19, 2003, Decree. For the reasons stated below, no finding of contempt is possible.

F. The Remedy Issue

Kansas also seeks injunctive relief (including the appointment of a river master), pre-set sanctions for future violations, and a monetary award for past violations. For the reasons stated below, the record does not warrant either injunctive relief or the setting of sanctions for possible future breaches. Kansas should, however, receive a judgment against Nebraska in the amount of $5,500,000.

For ease of reference, the balance of this Report will refer to each of the foregoing issues by the shorthand, bold titles used above.

VI. ANALYSIS

A. The Accounting Procedure Issue

It is difficult to measure the hydrological effect of wells on the underground flow of water and on the resulting flow in rivers and streams fed by the groundwater. Depending on the precise location of the well and a variety of factors, a particular well might not impact the flow of a particular stream, or it might impact it very directly, or it might impact it only gradually over time, potentially over very many years. (*See* C03 at 2-4; N1002 at 19-25 of 401.) Actually measuring such impacts in the field for an area covering almost 25,000 square miles with thousands of wells and numerous streams is, as a practical matter, impossible.

The states therefore developed a computer model, the RRCA Groundwater Model, intended to determine the amount, location, and timing of stream flow depletions to the Republican River from groundwater pumping by simulating what happens in the real world. The Groundwater Model is, in essence, a compilation of computer code, input files and rules that work together to create a mathematical representation of how the drafters of the Groundwater Model expect the real world to change if specified inputs change. (*See* Final Report at 6, 8-9.)

In addition to simulating stream flow depletions in the basin caused by groundwater pumping, the Groundwater Model simulates the stream flow accretions caused by water imported from outside the

Republican River Basin. (C01 at 5.) Some water diverted into canals for irrigation from the Platte River seeps south into the Republican River Basin, affecting stream flows in the Basin. (Schneider Direct re Counterclaim at ¶ 12.) The FSS recognizes this phenomenon, and classifies this water as "Imported Water Supply," which is defined as "[t]he water supply imported by a State from outside the Basin resulting from the activities of man." (FSS at § II; *see* Second Report at 62-64; Final Report at 9.) This "Imported Water Supply" that has seeped into the Basin can be consumed within the Basin by groundwater pumping, or by diversions of the increased river flow created by the seepage of imported water. (Schneider Direct re Counterclaim at ¶¶ 12, 17; Schreüder Direct at 6; C01 at 5, 20.)

The directions for using the Groundwater Model and its outputs are supplied in 114 pages of procedures referred to as the RRCA Accounting Procedures. The Accounting Procedures were developed in conjunction with the FSS and were enacted by the RRCA pursuant to Article IX of the Compact, which provides that the states "may, by unanimous action, adopt rules and regulations consistent with the provisions of this compact." Compact art. IX. The introduction to these procedures states in relevant part:

> This document describes the definitions, procedures, basic formulas, specific formulas, and data requirements and reporting formats to be used by the RRCA to compute the

> Virgin Water Supply, Computed Water Supply, Allocations, Imported Water Supply Credit and Computed Beneficial Consumptive Use. These definitions, procedures, basic and specific formulas, data requirements and attachments may be changed by consent of the RRCA consistent with Subsection I.F of the Stipulation.

(FSS app. C at C6.) Both the Groundwater Model and the Accounting Procedures are the product of judgment and compromise in the context of imperfect knowledge. (Tr. at 722-26 (Schreüder).)[9] The Accounting Procedures were negotiated and agreed to at the time that the states executed the FSS in December of 2002. (*See* FSS app. C.) The Groundwater Model itself, though largely completed at the time the states executed the FSS, was not finalized until later in 2003 after the Court approved the FSS. (*See* Final Report at 1; Second Report at 38-39; FSS at § IV.C.2 (expressing intent to complete the Model); *id.* at § IV.C.3-9 (recognizing creation of the Modeling Committee and directing completion of the model).)

As the parties accumulated experience working with the Accounting Procedures and the Groundwater Model over time, under varying conditions, their

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[9] Citations to "Tr." are citations to the transcript of the primary hearing in this matter, held in August 2012. That transcript, in nine volumes, is included on the docket at entries 368 to 374, 376, and 378. Citations to "August 2013 Tr." are citations to the transcript of the one-day hearing held on August 15, 2013, included on the docket at entry 499.

ability to gauge the extent to which there are previously unknown disparities between real world conditions and the picture painted by application of the Groundwater Model and the Accounting Procedures has grown. (*See* Tr. at 676-77 (Schreüder).) The FSS itself expressly anticipates the prospect of change, stating: "The RRCA may modify the RRCA Accounting Procedures, or any portion thereof, in any manner consistent with the Compact and this Stipulation." (FSS at § I.F.) In fact, the RRCA has modified the Accounting Procedures multiple times. (*See* Tr. at 875 (Pope); *see, e.g.*, J3 at JT2154A (44th Annual Report of the RRCA, showing changes to the Accounting Procedures, including a change to accounting of the evaporation from Lovewell Reservoir).) The RRCA, however, may act only by unanimous consent of the three states. *See* Compact art. IX ("Such officials may, by unanimous action, adopt rules and regulations consistent with the provisions of this compact."). (*See also* FSS at § VII.A.2 ("RRCA action must be by unanimous vote.").)

The accounting issue that has now become the focus of a dispute among the parties concerns the imported water supply. Nebraska contends that the Accounting Procedures agreed to in 2002 mistakenly treat the consumption of imported water in some circumstances as if it were the consumption of virgin water supply of the Basin, and that such a treatment is contrary to the parties' shared intent in agreeing to the Accounting Procedures, and to the Compact. While Colorado concurs, Kansas does not. Nebraska

therefore asks that the Court order the Accounting Procedures to be changed.

In the following subsections of this Report, I examine whether the current Accounting Procedures do have an effect contrary to what the parties intended and, if so, whether the Court should order the Accounting Procedures reformed to eliminate such an unintended effect over the objections of Kansas.

1. The States Clearly Did Not Intend to Treat the Consumption of Any Material Amount of Imported Water As If It Were the Consumption of Virgin Water Supply.

The Compact only regulates water "originating in" the Republican River Basin. Compact art. III (noting that the states' allocations are to be "derived from the computed average annual virgin water supply originating in" the Basin). It therefore does not regulate the use of water imported from outside the Basin, including the water imported from the Platte River. In entering into the FSS, no state sought to expand the reach of that regulation by venturing outside "the boundaries of the Compact." (Second Report at 2.) To the contrary, the states represented that "[t]he States agree that [imported] water should not count as virgin water supply or as a

computed beneficial consumptive use."[10] (J6 at JT3086.) Computed Beneficial Consumptive Use ("CBCU") is the term adopted by the states in the FSS for the calculation of Beneficial Consumptive Use, and is defined as the "stream flow depletion resulting from" certain specified "activities of man." (FSS app. C at C8.) The FSS unambiguously specifies that "Beneficial Consumptive Use of Imported Water Supply shall not count as Computed Beneficial Consumptive Use or Virgin Water Supply." (FSS at § IV.F.)

The same sub-article of the FSS also states that "[d]eterminations of Beneficial Consumptive Use from Imported Water Supply (whether determined expressly or by implication) and any Imported Water Supply Credit shall be calculated in accordance with the RRCA Accounting Procedures and by using the RRCA Groundwater Model." (FSS at § IV.F.) One might argue that this latter sentence evidences an intent to adopt by agreement an artificial definition of "Beneficial Consumptive Use of Imported Water Supply" as meaning whatever the Accounting Procedures and Groundwater Model determine it to be, whether correct or not. There is no evidence, though, that the parties intended the FSS to substitute for actual conditions an artificial construct that materially varies from reality.

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[10] Parol evidence is admissible to prove mutual mistake and obtain reformation. Restatement (Second) of Contracts § 214(d), (e) (1981).

Rather, the evidence is to the contrary. According to one of Kansas' own representatives who negotiated the FSS, the Accounting Procedures were "intended to properly carry out" the FSS' provisions excluding Imported Water Supply from CBCU. (Tr. at 863-66, 869-71 (Pope) (referencing hearing transcript at J6 at JT3087-88).) The parties selected the model based on a conviction that it "matches as closely as possible the actual effects of both alluvial and table-land groundwater pumping on stream flow in the Basin." (Second Report at 37.) As noted by Special Master McKusick, the aim of the Accounting Procedures was to "implement the principles of the Final Settlement Stipulation and allow the RRCA to determine compliance with the Compact and the Final Settlement Stipulation and to understand with greater precision how water in the Basin is being used and how it might be used more efficiently." (Second Report at 47-48; *see also id.* at 29 (noting "the goals of using water in the Basin with maximum efficiency and of accounting for water use as accurately as possible").) On the specific subject of imported water supply, Special Master McKusick's Second Report flatly stated:

> The Final Settlement Stipulation resolves this issue by providing that beneficial consumptive use of imported water will not count as computed beneficial consumptive use or as virgin water supply.

(Second Report at 64.)

Nor is there any evidence that either Nebraska or Kansas was aware prior to 2007 that the specific Accounting Procedures upon which they agreed in 2003 had the effect of which Nebraska now complains. In the present proceeding, Colorado's expert, Dr. Willem Schreüder,[11] testified that, while he "intellectually understood" in 2003 the possibility that imported water might be counted as virgin water, "we didn't think that it would occur, it would be of significant magnitude." (Tr. at 676 (Schreüder); *see* Tr. at 727 (Schreüder) ("[W]e didn't believe that that was going to be a big issue.").) Schreüder clarified that, when he said "we," he only spoke for himself. (Tr. at 676-77 (Schreüder).) There is no evidence that anyone else was even intellectually aware of any possibility that the accounting procedures being adopted could work at material cross purposes in any way with the parties' agreement that use of imported water not count as use of virgin water. And certainly there is no evidence of any discussions implying such an awareness. (Tr. at 727-28 (Schreüder).) Even as late as 2013, Kansas'

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[11] Willem Schreüder is an expert in the mathematical modeling of groundwater hydrology who holds a Ph.D. in Applied Mathematics in Computational Fluid Dynamics from the University of Stellenbosch and a Ph.D. in Computer Science in Parallel Systems from the University of Colorado at Boulder. (Schreüder Direct at 2).

hydrogeological expert Steven Larson[12] professed not to know whether the Accounting Procedures had the effect of which Nebraska complains. (Tr. at 374-75 (Larson).) When Nebraska in 2007 distributed its paper announcing that it had discovered the effect at issue, no one – including Kansas – suggested that the effect had been anticipated.

Correctly observing that Nebraska bears the burden of proving a mistake, Kansas argues that the absence of testimony by those individuals who participated for Nebraska in drafting the Accounting Procedures in 2002 constitutes a fatal failure of proof. Normally, this would be a strong point. Here, though, if one concludes as I do that the parties were sincere in their descriptions of the FSS to Special Master McKusick and to the Court, then it is clear that none of them believed in 2003 that the procedures would treat material amounts of imported water as if it were virgin water supply of the Basin. If any Nebraska representative in 2002 had concluded that the Accounting Procedures would mislabel a substantial amount of imported water as virgin water supply, there is no reason why he would not have then raised the point to secure a correction. All parties were in agreement on the principle that imported water supply not be so treated.

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[12] Steven Larson is a consulting hydrologist who holds a Masters in Civil Engineering from the University of Minnesota. (Larson Direct at 2-3.)

Nor is there any evidence that such a mistreatment of imported water supply was being traded off for some benefit to Nebraska. While Kansas correctly asserts that, as a general matter, the parties made bargains and compromises in the course of negotiating the FSS, the Accounting Procedures, and the Groundwater Model (Tr. at 875-77 (Pope)), there is simply no evidence that an unexplained deviation from a foundational principle was part of one such bargain. To the contrary, the testimony of Kansas witnesses Pope and Laron make clear that Kansas was not aware in 2003 that the procedures would treat the consumption of imported water in some circumstances as if it were the consumption of virgin water supply. (Tr. at 873-77 (Pope).)

In a draft of this Report distributed to the parties on January 9, 2013, I made the following observations:

> Although Kansas has not argued the point, I have considered the possibility that perhaps Kansas in agreeing to the FSS had in mind a bottom line amount of water that it believed the Accounting Procedures would generate from use of the Groundwater Model, and acceded to a variety of other terms only because it thought it was getting such an amount. There is no evidence, however, of any such calculation. Rather, the parties agreed to the terms of the FSS and the Accounting Procedures before the Groundwater Model was completed, and Kansas offers no

evidence that it employed any draft of the Model to justify any such trade-off.

At the time, Kansas had passed up several opportunities to argue that the bottom line usage permitted by the FSS was a critical factor in its decision to join the settlement. Kansas made no such argument in its expert reports submitted in Spring 2012, during the evidentiary hearing in August 2012, or in its post-hearing brief submitted after that hearing. Kansas' silence on the issue continued after I distributed the draft Report. Indeed, as late as August 15, 2013, the date of the final evidentiary hearing in this case, Kansas had never plainly contended that it or any other state relied on bottom line figures in the FSS negotiations.[13]

At that August 2013 hearing on other, unrelated issues concerning the proposed change to the Accounting Procedures, Kansas' counsel elicited testimony from Larson and Pope indicating that Kansas was concerned with the "bottom line" during negotiations over the FSS. Larson testified as follows:

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[13] In its comments on the draft Report, Kansas did not directly claim that it relied on the bottom line allocations but noted that "the key parts of the Groundwater Model were completed at the time the parties agreed to the Accounting Procedures." (Kansas' Comments on the Draft Report at 7-8, *Kansas v. Nebraska*, No. 126 Orig. (January 22, 2013) (Dkt. No. 424).)

Q: Were the states, nevertheless, keeping an eye on the bottom line of where the total agreement was bringing them as far as the bottom line?

A: Yes. I think, as we went through the process, we were looking at alternative calibrations. And associated with those calibrations we would also assess what the impacts would be, the bottom line, as you call it.

(August 2013 Tr. at 59-60.) Similarly, Pope testified as follows:

Q: You were asked at several points during cross-examination about the extent of your involvement in decisions, including critical decisions during the negotiations of the FSS. Did that include decisions with respect to the bottom line that was being determined by those negotiations?

A: Absolutely. That's – that was really the big picture focus was to look at all of the components of the package. Certainly that included the results from the modeling effort. And we were very well aware of the choices that were being made in the accounting procedures, the various different aspects of the stipulation and obligations of the parties. And one of my jobs was to try to assimilate all of that and understand what it meant, what was that bottom line.

(August 2013 Tr. at 108.)

Pope further pointed out that, in negotiating the FSS, the parties had looked at the how the Model and Accounting Procedures would have measured usage for prior years, and that those results would obviously have differed had the Accounting Procedures been changed as Nebraska now requests. (*See* August 2013 Tr. at 109-10.)

None of this is surprising. It is undisputed that the parties calibrated the model and the Accounting Procedures by looking at the results they would have generated for historical periods. What is entirely missing from even this belated testimony is any evidence that Kansas would have withdrawn its agreement to the FSS had the mistake in the Accounting Procedures been corrected during the negotiations. To the contrary, when unfettered by leading questions from his counsel, Pope made clear that the parties, including Kansas, viewed the development of the model and the procedures as a good faith effort to implement the agreed upon principles set forth in the FSS: "the virgin water supply is still out there; and the challenge is just quantifying what that is." (Tr. at 105 (Pope).) Pope agreed that it was very important to the parties that "the FSS and its procedures and models comply as much as scientifically possible with the Compact." (August 2013 Tr. at 115-16.)

The record in this case, taken as a whole, shows that those who negotiated the Model and Accounting Procedures were charged with implementing as accurately as possible the principles agreed upon in the FSS, and that the adoption of the FSS was based

on the states' respective judgments that the modelers had succeeded without materially flouting the parties' agreement that the consumption of imported water not be treated as if it were the consumption of virgin water supply. There is no credible evidence that the negotiators worked backwards from a desired numerical result. Rather, on the subject of how to account for consumption, the parties agreed on basic principles, including that the consumption of imported water not be treated as the consumption of virgin water, and they intended that the Accounting Procedures reflect and implement those principles.

2. The Current RRCA Accounting Procedures Treat Consumption of Material Amounts of Imported Water under Some Circumstances As If It Were the Consumption of Virgin Water Supply.

In June 2007, Nebraska informed Kansas and Colorado via letter that it had discovered that, under dry conditions, the Accounting Procedures can interact with the outputs of the Groundwater Model to treat the consumption of imported water as if it were the consumption of the virgin water supply of the Basin, thereby increasing Nebraska's CBCU. (Schneider Direct re Counterclaim at ¶ 9; N1005 at 1, 73-77; Schreüder Direct at 7.) In that 2007 letter, Nebraska asserted:

> The state of Nebraska has determined that methods used to calculate Computed Beneficial

> Consumptive Use (CBCU) of water in the Nebraska portion of the Republican Basin have overstated the consumptive use. Imported Water Supply has been incorrectly included as part of the Virgin Water Supply. Therefore, Imported Water Supply has been incorrectly included as part of the CBCU.

(N1005 at 73.) The technical analysis of how the Accounting Procedures and the Groundwater Model produce such results is detailed in reports that Nebraska's experts began generating over five years ago. (*See* N1002 at NE500125-211, 325-90.) No Kansas expert or lay witness has offered any testimony in this action to the contrary. Instead, in their lengthy and detailed reports and testimony, Kansas' witnesses directed their arguments to the adequacy of the remedies proposed by Nebraska and the Court's ability to mandate any change at all in the agreed upon procedures.

The testimony of Colorado witness Schreüder supports the contention raised by Nebraska in its 2007 letter. Schreüder, who has maintained the official version of the Groundwater Model and performed the annual updates to the Model since 2003 (Schreüder Direct at 2), agreed with Nebraska's experts that, "[u]nder the current accounting procedures, Nebraska is charged for the consumption of imported water as CBCU" (*id.* at 9).

The current procedures can treat the consumption of imported water as if it were virgin water supply because of an interaction between two factors.

First, groundwater pumping counts as consumption only to the extent that it depletes stream flow. (Schreüder Direct at 7; *see* FSS app. C at C20.) The extent of that depletion is calculated by comparing the results of a Groundwater Model simulation run with all Nebraska pumping "on" (*i.e.*, assuming that estimated pumping is occurring) and a model run with all Nebraska pumping "off" (*i.e.*, assuming no pumping by Nebraska). (Schreüder Direct at 7, 9.) The difference is the reduction in stream flow. Second, the reduction in stream flow cannot exceed the total flow of the stream (*i.e.*, when the stream runs dry, further pumping causes no further depletion).

In this respect, the interaction between groundwater pumping and stream flow is non-linear. "Non-linear" in this context means that the output of a function does not vary in direct proportion to the input. An ordinary bathroom scale, for example, customarily reads out weight measurements linearly as a function of weight added to the scale until roughly 300 pounds or so, at which point its measurement capacity is exceeded and additional weight does not cause a proportional increase in the scale's output. (X equals Y only when Y is less than 300 pounds.) In the Basin, stream flow can play the role of a scale, falling as groundwater pumping increases until it hits zero, at which point it falls no more even as groundwater pumping continues.

Imported water, however, can create stream flow in what would otherwise be a dry riverbed. (Schreüder Direct at 3, 7, 9-10.) To follow the scale

analogy, it can be like adding 20 pounds of measurement capacity to a scale that could otherwise register only up to 300 pounds. Hence, running the model simulations in the current manner, without eliminating imported water, can lead to a higher CBCU, part of which would therefore include the consumption of imported water supply. (Schreüder Direct at 3, 7, 9; C01 at 20.)

By June of 2007, Nebraska had determined that the foregoing interaction, during many periods, was causing Nebraska to be charged with the consumption of imported water. (N1005 at 73.) Kansas' response has been to act as if Kansas is from Missouri, so to speak, professing skepticism and demanding that Nebraska show that such an unexpected result has occurred. Nebraska has done so, quite convincingly. (*See, e.g.*, N1002 at 125-209, 325-90 of 401.)

Illustrative of Kansas' limited response is the testimony of its expert, Larson. Larson was on the Kansas team that negotiated components of the FSS, including the Groundwater Model. (Tr. at 726-27 (Schreüder).) He subsequently was retained by Kansas in 2007 to address Nebraska's contention that the current Accounting Procedures treated the consumption of some imported water as if it were the consumption of virgin water supply. (Tr. at 342-44 (Larson); K127.) In his written submissions, Larson did not state whether he agreed or disagreed with the factual assertion that the current Accounting Procedures treat the consumption of some imported water under dry conditions as if it were the consumption of

virgin water supply under the Compact. When asked point blank whether he challenged that assertion, he replied that "I'm not sure," (Tr. at 374 (Larson)), though he acknowledged that it was possible that Nebraska was being charged for the consumption of imported water supply (Tr. at 352-53 (Larson)). He implausibly claimed that in the more than five years during which Nebraska has sought various remedies based on its claim that it was being charged with the consumption of imported water, he has not addressed the assertion directly "because I think it takes a fair amount of model run evaluation to do that; and I haven't been able to do that " (Tr. at 374-75 (Larson).)

For the first time in its post-hearing reply brief submitted in October of 2012, Kansas claimed that credits calculated under the Accounting Procedures effectively offset the treatment of some imported water as if it were virgin water supply, so that, net, there is no problem of consumption of imported water. Kansas later withdrew this explanation when its own expert would not support it. (Corrected Transcript of Telephone Conference of May 23, 2013 at 14-15, *Kansas v. Nebraska*, No. 126 Orig. (Dkt. No. 476).) It was clearly mistaken. (*Id.*)

Based on this record, it is clear that the current Accounting Procedures do sometimes treat the consumption of some imported water as if it were the consumption of the virgin water supply of the Basin. They do so by including imported water when running

the model simulations used to calculate CBCU. For the year 2006, the amount of imported water counted as CBCU was 7,797 acre-feet. (N1004 at 6.)[14]

3. The Court Should Order the RRCA Accounting Procedures Reformed to Correct the Erroneous Treatment of Imported Water As If It Were Virgin Water Supply Under the Compact.

Given the foregoing, Kansas' central argument for rejecting Nebraska's request is that a deal is a deal, and the Court cannot rewrite a contract. While Kansas in this manner aptly summarizes a principal tenet of the law of contracts, that tenet is subject to narrow but well-established exceptions. On a proper showing, courts do reform contracts to correct certain types of mistakes. *See Philippine Sugar Estates Dev. Co. v. Gov't of Philippine Islands*, 247 U.S. 385, 389 (1918) ("It is well settled that courts of equity will reform a written contract where, owing to mutual mistake, the language used therein did not fully or accurately express the agreement and intention of the parties."); *Hearne v. Marine Ins. Co.*, 87 U.S. 488, 490 (1874) ("The reformation of written contracts for fraud or mistake is an ordinary head of equity jurisdiction."). *See also* Restatement (Second) of Contracts

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[14] The amount will vary from year to year based on a number of factors, driven largely by the presence of nearly dry stream beds in areas into which imported water seeps.

§ 155 (1981); 27 R. Lord, Williston on Contracts § 70:20 (4th ed. 2003). The questions to be addressed next, therefore, are as follows: is reformation available even here, where the agreement is between states; if so, has Nebraska satisfied the traditional requirements for reformation; and, finally, are there any reasons why the Court should nevertheless decline to grant the specific relief requested?

a. Reformation of the Accounting Procedures is an available form of remedy in this action.

Were the Accounting Procedures part of the Compact itself, the availability of reformation as a possible remedy could be problematic. The Court has never expressly reformed a compact. Because a compact requires congressional approval in order to be effective, it remains not simply a contract, *see Texas v. New Mexico*, 482 U.S. 124, 128 (1987) ("[A] compact is, after all, a contract." (citations and quotation marks omitted)), but becomes as well a "law of the United States," *Texas v. New Mexico*, 462 U.S. 554, 564 (1983) (quoting *Cuyler v. Adams*, 449 U.S. 433, 438 (1981)). And courts are not in the business of reforming laws. *See Heckler v. Mathews*, 465 U.S. 728, 741-42 (1984).

The closest the Court has come to expressly reforming a compact was in resolving a dispute concerning the 1949 Pecos River Compact between Texas and New Mexico. A central issue in that case

was the meaning of the term "1947 condition" as used in the Pecos River Compact. Under the Pecos River Compact, the parties agreed that "New Mexico shall not deplete by man's activities the flow of the Pecos River at the New Mexico-Texas state line below an amount which will give to Texas a quantity of water equivalent to that available to Texas under the 1947 condition." *Texas v. New Mexico*, 462 U.S. 554, 559 (1983) (quoting Pecos River Compact). The Pecos River Compact further stated that "[t]he term '1947 Condition' means that situation in the Pecos River Basin as described and defined in the Report of the Engineering Advisory Committee." *Id.* The Report of the Engineering Advisory Committee included a study setting forth the engineers' baseline calculations of 1947 conditions to be used as a measure for determining variances for later years based on differing conditions. *Id.* at 558. Unfortunately, it turned out that the study was substantially in error. *Id.* at 560; *see* Report of Special Master on Obligation of New Mexico to Texas under the Pecos River Compact at 15-16, 37, *Texas v. New Mexico*, No. 65 Orig. (Oct. 15, 1979). These errors led to the filing of an original action. *Texas v. New Mexico*, 462 U.S. 554, 560-62 (1983). In that original action, the Court confirmed *per curiam* and without explanation, over the objection of a single justice, a report of the special master interpreting the term "1947 Condition" as not being what was described in the erroneous study included in the Report of the Engineering Advisory Committee, but rather as the real condition that the parties had intended to use, despite the fact that the Pecos River

Compact expressly defined the term "1947 Condition" by referring to the Report of the Engineering Advisory Committee. *Texas v. New Mexico*, 446 U.S. 540 (1980); *see* Report of Special Master on Obligation of New Mexico to Texas under the Pecos River Compact at 35-36, *Texas v. New Mexico*, No. 65 Orig. In short, the Court eliminated the impact of an incorporated and mistaken attachment not by reforming the attachment, but by adopting an interpretation of the Pecos River Compact that essentially eliminated the incorporation of the mistaken attachment. And in the same original action, the Court later reversed another subsequent ruling of the special master by noting that "unless the compact to which Congress has consented is somehow unconstitutional, no court may order relief inconsistent with its express terms." *Texas v. New Mexico*, 462 U.S. 554, 564 (1983).

Texas v. New Mexico thus weighs expressly against any judicial rewriting of a compact to correct an error, but at the same time establishes that the Court may eliminate the impact of such an error through an application of the Court's interpretive power that is so robust as to be almost indistinguishable from the act of rewriting. That approach was possible because, in rejecting the reference to the appendix as defining the "1947 Condition," the special master had handy an alternative definition that required no crafting: the actual "1947 Condition." In effect, by interpreting the term "1947 Condition" to mean the actual condition, the special master (and thus, one might infer, the Court in confirming his

finding) read the Compact, including its appendix, as containing an ambiguity due to the disparity between the term as construed in the text and the term as defined in the appendix. That ambiguity was then resolved in favor of the reading that comported with the parties' actual intent.

Here, a potentially more direct approach beckons. The error at issue appears in no part of any compact, and thus its correction requires no reformation of any law. While the FSS is certainly an agreement between several states, it neither received nor required any congressional approval. The only agreements between states that require congressional approval under the Constitution's Compact Clause, U.S. Const. art. I, § 10, cl. 3, are those that alter or affect the rights of the respective states in a manner that encroaches upon or interferes with the supremacy of the United States. *See United States Steel Corp. v. Multistate Tax Comm'n*, 434 U.S. 452, 468, 471 (1978); *New Hampshire v. Maine*, 426 U.S. 363, 369-70 (1976); *Virginia v. Tennessee*, 148 U.S. 503, 519 (1893). The FSS did not reallocate any rights of the respective states. To the contrary, as the FSS itself states, "[t]he States agree that this Stipulation and Proposed Consent Judgment are not intended to, nor could they, change the States' respective rights and obligations under the Compact." (FSS at § I.D.)

The FSS is thus more akin to the agreement that was at issue in *Wisconsin v. Michigan*, 295 U.S. 455 (1935). There, after the Court apportioned the parties' respective rights in their boundary dispute, the

parties themselves agreed on the language of a detailed decree intended to reflect and implement that prior apportionment. *Id.* at 457-60. When the parties later discovered that the agreed-upon language of the decree contained errors, *id.* at 460, the Court ordered the decree re-written over the objection of one of the parties in order to accord with the parties' intent that the decree implement the apportionment accurately, *id.* at 462-63. While the FSS is not itself a decree, it is a settlement agreement that served as the express basis for the Court's May 19, 2003, Decree and that was expressly intended to reflect the prior allocation of rights among the states as reflected in the Compact and this Court's Order of June 29, 2000. *See Kansas v. Nebraska*, 530 U.S. 1272 (2000). In these important respects, it is therefore very much the type of agreement that *Wisconsin* instructs may be reformed by the Court if reformation is otherwise appropriate.

For these reasons, I find that the FSS is not solely by its nature immune to reformation even if one assumes that compacts cannot be reformed by court order. To the contrary, for the very reason that the Constitution does not allow states to make on their own a binding agreement changing their respective rights in a manner that encroaches upon or interferes with the supremacy of the United States under a pre-existing compact, the FSS might be viewed as especially amenable to reformation to the extent that it mistakenly broadens the reach of the Compact.

b. Reformation is also the appropriate form of remedy in this action.

Equitable reformation of a contract is appropriate where the "writing fails to express the agreement because of a mistake of both parties as to the contents or effect of the writing." Restatement (Second) of Contracts § 155. *See Philippine Sugar Estates Dev. Co.*, 247 U.S. at 389; 27 Williston on Contracts § 70:20. As such, in order to obtain reformation, Nebraska must show both that the states agreed to preclude the inclusion imported water in a state's CBCU, and that they mutually erred in settling upon language (in the Accounting Procedures) that failed fully to effect that agreement. *See* Restatement (Second) of Contracts § 155, cmt. a. *See also Hearne*, 87 U.S. at 490-91; 27 Williston on Contracts § 70:21. These elements must be established by clear and convincing evidence. *See* Restatement (Second) of Contracts § 155, cmt. c. *See also Philippine Sugar Estates*, 247 U.S. at 391; *Hearne*, 87 U.S. at 490; 27 Williston on Contracts § 70:20. As explained in Sections VI.A.1 and 2 of this Report above, Nebraska has clearly established both of these elements: the parties did not intend that the Accounting Procedures should treat imported water as if it were virgin water supply, and the current Accounting Procedures nevertheless have exactly this unintended effect under some circumstances.

These conclusions do not mean that Nebraska is necessarily entitled to the relief it seeks. "Since the

remedy of reformation is equitable in nature, a court has the discretion to withhold it on grounds that have traditionally justified courts of equity in withholding relief." Restatement (Second) of Contracts § 155, cmt. d. I therefore turn now to considering the numerous remaining arguments that Kansas has advanced for withholding any equitable relief on this claim by Nebraska.

(i) Kansas' objections to allowing Nebraska even to file a counterclaim are without merit.

After Nebraska gave notice to the Court that it intended to raise its own claims in response to Kansas' petition, and in the exercise of the authority assigned to me to "fix the time and condition for the filing of additional pleadings," *Kansas v. Nebraska*, 131 S. Ct. 1847 (2011), I instructed Nebraska to file promptly a motion for leave to file any counterclaim it wished to file, together with a copy of the proposed counterclaims. (*See* Case Management Order No. 1 at ¶ 1.5, *Kansas v. Nebraska*, No. 126 Orig. (Apr. 28, 2011) (Dkt. No. 9).) Nebraska complied with my instruction by filing a motion to raise by way of counterclaim two matters that bore directly on determining the amount of water Nebraska used in 2006: the Accounting Procedures Issue and the Harlan County Lake Evaporation Issue. (*See* Brief in Support of Motion for Leave to File Counterclaims of the State of Nebraska, *Kansas v. Nebraska*, No. 126

Orig. (May 31, 2011) (Dkt. No. 22).) Nebraska alleged that the water volume at stake in resolving these two issues collectively accounted for a differential of 18,000 acre-feet in the parties' respective calculation of the amount of Nebraska's otherwise admitted overuse in 2006. (*See* Answer and Counterclaims of the State of Nebraska at 12-14, *Kansas v. Nebraska*, No. 126 Orig. (May 31, 2011) (Dkt. No. 23).)

Kansas filed an opposition to Nebraska's motion arguing, among other things, that Nebraska should not be permitted to raise the Accounting Procedure Issue in this action at all, because it was supposedly beyond the scope of the proceeding.[15] In an oral ruling of July 18, 2011, as subsequently confirmed in writing, I rejected Kansas' position that the counterclaim should not be allowed. (*See* Case Management Order No. 2 [Corrected] at ¶ 1, *Kansas v. Nebraska*, No. 126 Orig. (Aug. 9, 2011) (Dkt. No. 72).) Kansas has indicated that it reserves whatever right it has to seek review of my ruling. (*See* Kansas Post-Conference Submittal at 1-2, *Kansas v. Nebraska*, No. 126 Orig. (July 23, 2011) (Dkt. No. 57).) I therefore set forth my reasoning as follows.

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[15] Kansas has conceded that resolution of the Harlan County Lake Evaporation Issue is a necessary predicate to resolving Kansas' own claim. (*See* Kansas' Opposition to Nebraska's Motion for Leave to File Counterclaims at 16, *Kansas v. Nebraska*, No. 126 Orig. (June 30, 2011) (Dkt. No. 41) ("Kansas agrees that the dispute regarding how evaporation from Harlan County Lake is allocated among the States will need to be addressed and resolved in Kansas' claims against Nebraska.").)

Proposed new claims in an original action, whether asserted by counterclaim or otherwise, "must be scrutinized closely in the first instance to see whether they would take the litigation beyond what [the Court] reasonably anticipates when [the Court] granted leave to file the initial pleadings." *Nebraska v. Wyoming*, 515 U.S. 1, 8 (1995). "Accordingly, an understanding of the scope of this litigation as envisioned under the initial pleadings is the critical first step" in considering motions to change or add claims. *Id.*

Kansas' initial pleading accepted by the Court asserts that Nebraska overused its Compact allocation in 2006 and seeks a remedy for that overuse. (*See* Petition at ¶¶ 19-20.) Kansas' petition by itself therefore necessarily puts at issue the amount of Nebraska's overuse in 2006. That amount, in turn, was not settled by the RRCA because, among other things, the parties disagreed on whether the Accounting Procedures needed to be changed. (N8005 at 21-22; Barfield Direct at 27-28.) Kansas' own claim can therefore only be resolved by deciding which party is correct regarding whether the Accounting Procedures applicable to calculating Nebraska's use in 2006 should be changed. By raising the Accounting Procedure Issue, Nebraska thus drills into the scope of the litigation as initially pleaded by Kansas.

(ii) Nebraska gave sufficient notice that it relied on a theory of mistake in seeking reformation of the Accounting Procedures.

Kansas also argues, in the alternative, that the counterclaim fails to give notice that Nebraska would rely on a theory that the Accounting Procedures contain a mistake. Kansas is to some limited extent correct. Nebraska formally labeled its claim as merely a "Breach of Compact and FSS for Failing to Account Properly for Groundwater Use." (*See* Answer and Amended Counterclaim and Crossclaim at 15, *Kansas v. Nebraska*, No. 126 Orig. (July 25, 2011) (Dkt. No. 58).) Nevertheless, the factual allegations contained in Nebraska's answer, its affirmative defenses, and its counterclaim repeatedly allege that the Accounting Procedures contain a "mistake" (*id.* at 5) and a "discrepancy" (*id.* at 11). The pleading expressly asserts that the controversy over the alleged discrepancy creates continuing uncertainty and harm, and asks that the Court issue an order "incorporating Nebraska's accounting change." (*Id.* at 23.) This was fair notice for pleading purposes that Nebraska sought an order changing the procedures to correct a mistake.[16] *See generally Erickson v.*

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[16] In a brief, Nebraska asserted that it "is [n]ot [s]eeking to '[r]eform' the Compact or the FSS." (Nebraska's Brief Concerning Changes to RRCA Accounting Procedures at 10, *Kansas v. Nebraska*, No. 126 Orig. (June 15, 2011) (Dkt. No. 29).) In the context of a pleading that sought an order changing the

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Pardus, 551 U.S. 89, 93 (2007). Indeed, over a year before trial and as discovery was only just beginning, Kansas knew Nebraska sought the reformation of the Accounting Procedures on the grounds that their treatment of imported water was contrary to the parties' agreement set forth in the Compact and FSS. (*See* Kansas' Brief re Changes to the RRCA Accounting Procedures, *Kansas v. Nebraska*, No. 126 Orig. (June 15, 2011) (Dkt. No. 33).)

(iii) It matters not whether Nebraska could have discovered the error in 2003 when the FSS was finalized.

Citing section 154 of the Restatement (Second) of Contracts, Kansas argues that Nebraska's modelers likely knew in 2003 that the groundwater system and the model had non-linear characteristics. Therefore, Kansas contends, Nebraska could have figured out that the Accounting Procedures might well treat the consumption of imported water as if it were the consumption of virgin water supply in some circumstances.

Accounting Procedures, I construed that statement to mean that Nebraska is not seeking to make any change in the Compact or the language of the FSS itself, distinguishing the Accounting Procedures, to which Nebraska has from the outset of this case sought a change.

Factually, this assertion by Kansas' counsel that all parties knew or should have known that consumption of imported water might be charged to a state is belied by Kansas' own modeling expert, who professed even at the time of his 2012 testimony not to know whether Nebraska is charged with the consumption of imported water. (Tr. at 374 (Larson).) Indeed, after all the modelers had testified in the August 2012 hearing, Kansas' counsel, who represented Kansas in the prior litigation and settlement, filed a brief asserting Kansas' still-mistaken understanding that the procedures did not charge Nebraska with the consumption of imported water because the procedures gave Nebraska an off-setting credit. (Kansas' Post-Trial Reply Brief at 77-80, *Kansas v. Nebraska*, No. 126 Orig. (Oct. 15, 2012) (Dkt. No. 390).)[17]

And even if one were to ignore this evidence to the point of assuming that Nebraska could have known of the manner in which the model and procedures might interact, such an assumption would be irrelevant in this case of mutual mistake. The principles of section 154 are applicable to claims of unilateral mistake under section 153, *see* Restatement (Second) of Contracts § 154 cmt. a. This is not a case

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[17] Subsequently, in 2013, Kansas revised its asserted understanding in preparation for an expert designation on the issue. (Corrected Transcript of Telephone Conference of May 23, 2013 at 14-15, *Kansas v. Nebraska*, No. 126 Orig. (Dkt. No. 476).)

of unilateral mistake. Instead, Nebraska presses a claim for mutual mistake. Under section 157, fault by a party seeking reformation for a mutual mistake concerning the effect of the parties' written expression precludes reformation only when the fault rises to the level of a failure to act in good faith. *See* Restatement (Second) of Contracts § 157 & cmt. a. There is no evidence Nebraska lacked good faith with respect to this matter.

(iv) The Court can reform the RRCA Accounting Procedures without having to retract its May 19, 2003, Decree and reject the entire FSS.

Kansas points out that the FSS includes a non-severability clause providing that "[t]he agreement of the states to the terms of [the FSS] is based upon the inclusion of all the terms hereof, and the rights and obligations set forth in [the FSS] are not severable." (FSS at § VIII.) As explained by Special Master McKusick, the clause was intended to make clear that "[t]he agreement of each of the states to the terms of the Final Settlement Stipulation depends upon the inclusion of all its provisions. If the Court declines to approve the Final Settlement Stipulation in the form submitted, the states have agreed that the entire Final Settlement Stipulation will be null and void." (Second Report at 30; *see id.* at 74 (recommending that the Court "preserve the bargain that the

compacting States have struck" by "approv[ing] the Final Settlement Stipulation as a single whole").)

Kansas argues that, because the parties agreed that the FSS would not become effective and binding unless the Court approved it in full without change, it follows that the Court cannot now change any single portion of the FSS. In so arguing, Kansas implicitly concedes that the Court can relieve a party of the effect of a true mistake in the language the parties used to document their agreement. But the Court can only do so, Kansas argues, by rejecting the FSS as a whole.

This argument misapprehends the nature of the type of reformation at issue here. Nebraska does not seek reformation to change any portion of the parties' actual agreement. Rather, Nebraska carries the burden of making a clear showing that the parties by mistake used language that failed to convey the agreement they made. *See* Restatement (Second) of Contracts § 155 cmt. a ("The province of reformation is to make a writing express the agreement that the parties intended it should."). "In short, reformation fixes a mistaken writing; it is not meant to fix a mistaken agreement." *OneBeacon Am. Ins. Co. v. Travelers Indem. Co. of Ill.*, 465 F.3d 38, at 42 (1st Cir. 2006). Thus, if the Court approves this Report and reforms the Accounting Procedures, the Court would be effectuating, not changing, the FSS, just as the correction of the agreed-upon decree in

Wisconsin v. Michigan, 295 U.S. 455 (1935), effectuated rather than changed the parties' agreement.

A clause precluding severability reflects the fact that the agreement contains trade-offs, such that it would be unfair to delete one part of the agreement that might be the "quid" for another retained part of the agreement that is the "quo." *See In re Charter Commc'ns, Inc.*, 691 F.3d 476, 485 (2d Cir. 2012) (noting that "a nonseverability clause may be one indication that a particular term was important to the bargaining parties"). Here, for example, if there were evidence that the parties knew that the Accounting Procedures had the effect that they did, yet were retained because Kansas gave ground on some other point, then it would be unfair to change the agreement after the fact by "reforming" the procedures. As discussed in Section VI.A.1 above, however, there is no evidence that Kansas viewed the inclusion of some imported water as CBCU to be a benefit that it believed it was getting. To the contrary, the evidence is that the parties thought that the Accounting Procedures would not have this effect, and said as much at the time. *See In re Charter Commc'ns, Inc.*, 691 F.3d at 485 (noting that a court "cannot rely on [a nonseverability] clause to the exclusion of other evidence").[18] Given their mutual recognition that the

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[18] *In re Charter Communications* addresses a non-severability clause in the context of the equitable doctrine of mootness in bankruptcy proceedings, 691 F.3d at 481, but is informative as to the weight that should be given to non-severability clauses in

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FSS was not intended to conflict with or go beyond the boundaries of the Compact, it is difficult to see how the parties could have agreed to treat imported water in this manner (other than perhaps on a *de minimis* basis) unless there was indeed some offsetting reversal of this effect, to which no expert for any party has pointed.

Kansas tries to buttress its non-severability argument by contending that because the RRCA can change the Accounting Procedures only by unanimous consent, *see* Compact art. IX; FSS at § I.F, it should follow that no one can change them absent unanimous consent. This argument stretches a negative inference too far. It is fair to infer that, in view of the unanimity clause, fewer than all three states cannot of their own accord change the Accounting Procedures even though no express language so states. It goes too far to infer also that the Court cannot reform the Accounting Procedures at the behest of fewer than all the parties. After all, one can say that contracts generally can be changed by unanimous consent of the contracting parties, and generally may not be

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equitable proceedings more generally. It is of interest in this case only because of the equitable nature of reformation and the paucity of case law discussing reformation (as opposed to partial rescission) of contracts with a non-severability clause. In any event, I do not rely on *In re Charter Communications* as controlling precedent. The key point is that reformation will not change anything that the parties agreed to but will instead simply effectuate the agreement of the parties.

changed by fewer than all such parties. Yet, it hardly follows that contracts generally are therefore immune to reformation where otherwise appropriate.

None of this is to say that a technical appendix to an agreement such as the FSS is subject to reformation by a court simply to reflect better judgments or accommodate new facts. Nor is the Court likely to entertain requests that it correct *de minimis* errors. *See Texas v. New Mexico*, 462 U.S. at 570 (The Court has "substantial discretion to make case-by-case judgments as to the practical necessity of an original forum in this Court.") Reformation requires a clear showing that a document need be rewritten to correct an error of expression – in words or math – that materially conflicts with the actual agreement. Equity in this manner balances the competing goals of honoring the terms chosen by the parties to document their agreement and saving the parties from mutual error should they unwittingly employ terms that materially run contrary to the agreement itself.

4. The Court Should Order the Parties to Implement the Five-Run Solution for Years Subsequent to 2006.

To recap, the Accounting Procedures erroneously charge Nebraska with consuming water that was never part of the virgin water supply but was instead imported into the Basin. As an illustration, imagine that, in an area in which no other state pumps,

Nebraska's pumping would deplete the entire natural stream flow. Under the Compact, Nebraska should be charged with the depletion of the stream flow and no more. But if imported water supplements the natural stream flow, and Nebraska's pumping also depletes that supplement, Nebraska will be charged under the current Accounting Procedures with the depletion of both the natural stream flow and the depletion of additional stream flow caused by imported water. Having determined that this result is the product of a mistaken failure to reflect in the Accounting Procedures the parties' agreement concerning the treatment of imported water and that the Court can reform the procedures to correct that mistake, I turn now to the details of the correction.

a. Nebraska's so-called five-run solution corrects the mistake.

Nebraska proposes what the parties have called the "five-run solution" (and sometimes the "five-run proposal") to remedy the mistake in the Accounting Procedures. Colorado supports the solution. The exact technical changes in the RRCA Accounting Procedures called for by this proposed solution are attached as Appendix F.[19] Like the current Accounting

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[19] The parties agree that both the Accounting Procedures and certain portions of the computer code associated with the Groundwater Model will need to be revised in order to implement the five-run solution. With respect to the latter, I provide in Appendix G the changes to the computer code agreed upon by

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Procedures, the five-run solution provides for each state's groundwater consumption to be computed by comparing the output from two "runs" of the Groundwater Model. (Nebraska's Responsive Expert Report to Kansas' Expert Report on Nebraska's 5-Run Proposal at 3, *Kansas v. Nebraska*, No. 126 Orig. (July 9, 2013) (Dkt. No. 479).) In the "baseline" run, the Model would assume that all three states engage in groundwater pumping. (*Id.*) In the "no state pumping" run, the Model would assume that the state being assessed does not engage in pumping, while the other states do. (*Id.*) A state's groundwater usage would be equal to the difference between the outputs from the two runs.[20] (*Id.*)

The five-run solution departs from the current Accounting Procedures by assuming, in each Model run, that Nebraska does not import water into the Basin. As a result of this simple modification, imported water is absent from the Model's computations, and Nebraska is no longer charged with consuming it.

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the parties (reserving Kansas' objections to the adoption of the five-run solution).

[20] In all, the five-run solution requires one baseline run and three no state pumping runs. A fifth run is used to calculate the credit received by Nebraska for importing water into the basin. With respect to the credit, the five-run solution does not alter the methodology in the current Accounting Procedures. (Nebraska's Responsive Expert Report to Kansas' Expert Report on Nebraska's 5-Run Proposal at 3, *Kansas v. Nebraska*, No. 126 Orig. (July 9, 2013) (Dkt. No. 479).)

(*Id.* at 3, 5; Schneider Direct re Counterclaim at ¶¶ 26, 70-71.)

Just as the mistake effectively reduced Nebraska's actual share of virgin water supply below that to which the parties agreed, the correction increases Nebraska's actual share so that it more accurately approximates the agreed-upon share. Marginal effects of non-linearity notwithstanding, any such increase in one state's share is generally a zero sum game, here played to the detriment of Kansas, so reversing the mistake benefits Nebraska and disadvantages Kansas as compared to the status quo. Not surprisingly, Kansas therefore opposes the entire notion of making any change. This Report addresses that opposition above at pages 19 to 54. In addition, Kansas raises several arguments to the effect that, even if there is a mistake that should be corrected, the five-run solution is not an appropriate correction. To those arguments I now turn.

b. Kansas' criticisms of the five-run solution are unfounded.

There is a long and convoluted history surrounding Nebraska's proposal of, and Kansas' opposition to, the five-run solution, largely because Nebraska initially pursued a different proposal in this litigation and also because Kansas exploited Nebraska's change of course by raising a series of objections and claims of prejudice that mostly turned out to be without basis and flatly inconsistent. The details of the

parties' respective maneuverings on this issue are lengthy. Except where otherwise indicated in the body of this Report, they are also irrelevant to my assessment of the five-run solution. I nevertheless expect that the parties may press before the Court their competing versions of who did what to whom procedurally. I therefore include as Appendix H of this Report a detailed description of the parties' respective maneuvers.

Returning to the substance of the matter, I find that the five-run solution is a surprisingly simple change to the RRCA Accounting Procedures that accurately eliminates the mistaken treatment of imported water supply without introducing any other error into Compact accounting. In reaching this conclusion, I have considered each of Kansas' arguments to the contrary. My reasons for rejecting those arguments follow.

(i) The five-run solution will not create any unreliability in Compact calculations.

Kansas has contended that the five-run solution will generate unreliable calculations because it employs a baseline that cannot be calibrated using historical data. (Kansas' Expert Report on Nebraska's 5-Run Proposal at 2, *Kansas v. Nebraska*, No. 126 Orig. (May 15, 2013) (Dkt. No. 455).) Although it is true that the five-run solution employs an

uncalibrated baseline, it does so in a manner that cannot impair reliability. The exclusion of imported water from the baseline run of the Model will have little effect on the calculation of consumption by Kansas and Colorado because the overwhelmingly large proportion of those states' pumping occurs in sub-basins in which the amount of water imported is itself zero, or very small. (*See* C01 at 10.) And the Model generally is not overly sensitive to changes in the amount of imported water. (*See* Colorado's Expert Report in Response to Kansas' Expert Report under Case Management Order No. 9 at 8-9, *Kansas v. Nebraska*, No. 126 Orig. (July 9, 2013) (Dkt. No. 477).)

Nor will the use of a new baseline increase uncertainty in the calculation of consumption by Nebraska. In the equations used in Nebraska's proposal, the mathematical term associated with the new baseline cancels out when Nebraska's computed usage is added to the credit received by Nebraska for importing water. (Nebraska's Responsive Expert Report to Kansas' Expert Report on Nebraska's 5-Run Proposal at 5, *Kansas v. Nebraska*, No. 126 Orig. (July 9, 2013) (Dkt. No. 479).) Consequently, the net impact of Nebraska's activities is calculated through a mathematical expression that is algebraically equivalent to subtracting from the *current* baseline the output of a Model run in which Nebraska is assumed to neither engage in groundwater pumping nor import water. (*Id.*) This result has been confirmed by the analysis of Kansas' own expert Perkins. (*See* N4503.)

To bolster its calibration argument, Kansas claimed that the Groundwater Model overestimates water levels in areas in which Nebraska imports water and underestimates the efficiency of irrigation in Colorado and Nebraska. (*See* Kansas' Expert Report on Nebraska's 5-Run Proposal at 2-9, *Kansas v. Nebraska*, No. 126 Orig. (May 15, 2013) (Dkt. No. 455).) But these biases, if they exist, are also features of the current Accounting Procedures. (*See* Colorado's Expert Report in Response to Kansas' Expert Report under Case Management Order No. 9 at 25, *Kansas v. Nebraska*, No. 126 Orig. (July 9, 2013) (Dkt. No. 477).) There is no evidence that the alleged biases would be worse under the five-run solution.

Finally, even if the new baseline were to somehow marginally decrease the reliability of Model calculations, Kansas has produced no evidence that this diminished reliability would systematically harm Kansas or any other state, or that it would be material in any respect.

(ii) The five-run solution will not significantly increase "residuals."

Kansas' remaining argument concerns "residuals" or "unaccounted impacts": water usage that is not attributed to any state although it is assumed to occur. (*See* Kansas' Expert Report on Nebraska's 5-Run Proposal at 13, *Kansas v. Nebraska*, No. 126 Orig. (May 15, 2013) (Dkt. No. 455).) Residuals are

indeed an artifact of the Groundwater Model and Accounting Procedures adopted by the parties. Residuals arise from the interaction of three features of the framework the parties created to administer the Compact. First, the Groundwater Model estimates for a given time period the depletion in stream flow rather than the amount of groundwater pumped, consistent with Special Master McKusick's conclusion that the Compact regulates groundwater pumping based on its effect on stream flow. (First Report at 23.) Second, in measuring the depletion caused by a state's pumping, such depletion must always be capped by the amount of water projected to run through the stream if no state engaged in pumping. In other words, even if a state (or group of states) pumped enough groundwater to cause depletion of the entire stream and then some, calculated usage would be limited by the amount of pumping that would have been sufficient to deplete the stream. Third, under the Accounting Procedures, what matters is each state's *marginal* contribution to stream flow depletion, *i.e.,* the amount of additional depletion caused by that state's pumping when added to the pumping of the other states.

To illustrate how these principles interact to create residuals, refer back to the bathroom scale analogy discussed above at pages 34 to 35. Just as states' usage is capped by the amount of water that would have flowed through nearby streams with no pumping, so too is the measurement capacity of a bathroom scale capped by the maximum amount of

weight the scale can measure. If the scale has a maximum measurement capacity of 300 pounds, and two people each weigh 155 pounds, then each person will make a *marginal* contribution of 145 pounds when stepping onto the scale after it already bears the weight of the other person. Together, their marginal contributions will sum to only 290 pounds, even though the scale's measurement capacity is fully occupied at 300 pounds. The 10-pound difference between those figures is the equivalent of a residual. To translate this example into the context of this case, two states might each pump enough groundwater in an area to cause stream depletion of 16 cubic feet per second ("cfs"), but if the stream flow, absent all pumping, would have been 30 cfs, each state will only be charged with pumping corresponding to 14 cfs. This creates a residual corresponding to 2 cfs, the difference between the cumulative stream depletion of 30 cfs and the sum of the 14 cfs usage charged to each of the two states. (*See* N1002 at 38-39, 43-47 of 401.)

None of this is the product of any mistake, a point conceded by Kansas' own modeling expert, Larson. In agreeing to the RRCA Groundwater Model and the RRCA Accounting Procedures, "[t]he states recognized that the sum of the impacts individual activities would not necessarily exactly equal the model-computed impact of all of the activities considered simultaneously." (K127 at KS3895.) As Larson further explained:

> [I]f the impact of all activities considered simultaneously were used, it would be necessary to have a method for apportioning the impact among the various activities. Such a process was considered unnecessary and it was agreed that the impacts from each state's activity would be computed separately in spite of the fact that the sum of those impacts may not exactly equal the impact of all activities considered simultaneously.

(*Id.*)

There were good reasons why the states agreed to a model and accounting procedures that did not account immediately for the impact of all pumping. Attempting to account for residuals was seen as difficult and fraught with risks of error because the alternative baseline run that would have been necessary was entirely uncalibrated in a way that would not have been either marginal or compensated by any offset. (*See* August 2013 Tr. at 171 (Schreüder); C01 at 23 n.7.) When Nebraska proposed the so-called sixteen-run solution to both eliminate the consumption of imported water from Compact calculations and to allocate residuals fully, both Colorado and Kansas raised numerous objections that Nebraska could not adequately address. (*See*, *e.g.*, C01 at 7-10, 13-21.) And while Kansas' experts spent a year trying to create a proposal allocating the residuals, they did not come up with anything sufficiently complete to warrant analysis. (*See infra* Section VI.A.4.c.) Moreover, the residuals are distributed among the three states, with each state engaging in some pumping

that depletes stream flow but is not counted as usage. No showing has been made that the existence of residuals disproportionately or materially harms or benefits any state.

With the foregoing explanation of residuals as background, I turn to Kansas' argument. Kansas claims that by treating the consumption of imported water as if it were the consumption of virgin water supply, the model generated "positive" residuals that "balanced out" any negative effect of other residuals on Kansas. In other words, while the residuals discussed above allow the states to deplete the virgin water supply without being fully charged with corresponding water usage, the charging of Nebraska with the consumption of imported water does just the opposite, charging Nebraska with consumption although the virgin water supply is unaffected. Coincidentally, the "negative residuals" roughly equal in magnitude the "positive residuals."

Kansas' argument depends on a false equivalence between "negative residuals" and "positive residuals" – two entirely different phenomena, only the second of which was not anticipated by the parties when they agreed to the FSS, and only the second of which has been shown to harm just one of the states (Nebraska) to any significant degree. To see the difference between the two effects, it is helpful to refer back to the scale analogy. As described above at pages 34 to 35, the charging of Nebraska with the consumption of imported water ("positive residuals") is analogous to adding 50 extra pounds of measurement capacity to

a scale that should have been capped at 300 pounds, so that a 400-pound person will appear to weigh 350 pounds although measured weight should not have exceeded 300. Because Nebraska is the only state that imports water, and it primarily does so in sub-basins in which Nebraska pumps groundwater, Nebraska is the only state materially affected by this mechanism. On the other hand, as described above at pages 61 to 62, measuring marginal depletion of a fixed amount of stream flow ("negative residuals") is analogous to measuring the marginal effect of a person who weighs 155 pounds on the output of a scale with a fixed maximum measurement capacity of 300 pounds on which another 155-pound person is already standing. All three states are affected by this mechanism. In short, "negative residuals" and "positive residuals" are distinct phenomena, and only "positive residuals" cause a demonstrated and significant detriment to one of the states that was directly contrary to the parties' uniform expectations and intent.

But this is all just another way of saying the obvious: correcting for the mistake helps Nebraska and disadvantages Kansas. Kansas' "balancing out" argument is thus simply an alternative formulation of Kansas' argument that it agreed to the FSS in reliance of a bottom-line assessment that the agreed upon procedures produced a minimally satisfactory result. Indeed, Kansas cites its residual argument as a reason to "reconsider" portions of my draft Report explaining why there indeed did appear to be a

mutual mistake in the Accounting Procedures. I discuss Kansas' argument in Section VI.A.1 of this Report. Simply put, the contention is not credible. Indeed, this particular variant of the contention is belied by its provenance, having been raised at the very last minute, long after it would have repeatedly been raised had it truly reflected Kansas' state of mind.[21]

c. The "integrated solution"

Finally, Kansas offers its own modification to the Accounting Procedures, which it calls the "integrated solution." For several reasons, I do not reach the merits of Kansas' proposal. First, the proposal came far too late, at a time when it was not procedurally proper. Kansas first described the integrated solution on May 15, 2013, in an appendix to an expert report. Kansas could have presented the integrated solution as part of the voluminous expert reports submitted in

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[21] Nor did Kansas offer a single piece of paper or email supporting the claim that it agreed to the FSS in 2003 only because the Model and Procedures produced a required outcome. All it could offer was evidence that the parties ran the Model against historical conditions. There are many reasons why such runs would have been made, not the least of which is to calibrate the Model. Entirely lacking are contemporaneous documents or credible testimony evidencing that Kansas would not have signed the FSS had the Model runs been different by the amounts at issue. Regarding residuals specifically, Kansas' modeler knew they would likely exist, but saw no need to calculate their magnitude or nature. (August 2013 Tr. at 56-57 (Larson).)

2012 or during the six-day hearing in August of that year, when the accounting problem was squarely at issue. In January of 2013, I reopened the record on the narrow issue of "the Appropriateness of the 5-run Solution as a Remedy" in order to be absolutely certain that all parties received a fair opportunity to present evidence. (*See* Case Management Order No. 9 at ¶ 1, *Kansas v. Nebraska*, No. 126 Orig. (January 25, 2013) (Dkt. No. 431).)[22] Kansas' proposal, offered four months later, fell far outside the scope of that single remaining issue. Kansas' delay is particularly inexcusable because Kansas began work on the integrated solution months before the August 2012 hearing. (*See* Nebraska Responsive Expert Report to Kansas' Expert Report on Nebraska's 5-Run Proposal app. D at 4, 6, *Kansas v. Nebraska*, No. 126 Orig. (July 9, 2013) (Dkt. No. 479).)

In any case, I cannot evaluate the merits of the integrated solution because Kansas did not complete its work on the details of the proposal. Notionally, it appears to be simply a more complex and roundabout equivalent to the sixteen-run solution that was first proposed by Nebraska, and rejected by Kansas itself, in an earlier stage of these proceedings. (*See* Nebraska Responsive Expert Report to Kansas' Expert Report on Nebraska's 5-Run Proposal at 10, *Kansas v. Nebraska*, No. 126 Orig. (July 9, 2013) (Dkt. No. 479).) In any event, the designer of the integrated

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[22] I also kept the record open on an additional issue, but Kansas chose not to pursue that issue.

solution, Samuel Perkins, has admitted that the proposal is not yet finished. (*Id.* at 1.) The five-run solution, in contrast, is fully developed and has been subject to extensive scrutiny.

Finally, and most importantly, while Nebraska has proven that the current Accounting Procedures contain a mutual mistake regarding the consumption of imported water, no party has claimed, much less proven, that the current treatment of residuals is the product of a mutual mistake of expression. To the contrary, it was knowing and intended. Consequently, there would be no basis for ordering the adoption of the integrated solution even were it complete and otherwise without defect.

d. There is no need for the five-run solution to be submitted to non-binding dispute resolution.

Kansas correctly observes that the FSS establishes a multiple stage, non-binding dispute resolution process for "[a]ny matter relating to Republican River Compact administration, including administration and enforcement of the Stipulation in which a state has an Actual Interest." (FSS at § VII.A.1.) Kansas contends that even though Nebraska's request to change the RRCA Accounting Procedures to eliminate the improper treatment of imported water has been the subject of arbitration under these procedures, Nebraska did not then advocate this specific remedy.

It is not clear that the FSS precludes a party from refining the precise remedy it seeks following arbitration where the same underlying claim is advanced. If that were so, Kansas would be hoisted by this petard, as its damage presentation here varied materially from what it presented to the arbitrator, and the remedy I recommend it be awarded differs even more. In any event, in Case Management Order No. 9 I ordered that "[i]f any party believes that non-binding dispute resolution proceedings before the RRCA or an arbitrator concerning the [five-run solution] will not be futile , then that party will promptly initiate such proceedings so that they may be completed prior to August 2013." (*Kansas v. Nebraska* at ¶ 5, No. 126 Orig. (Jan. 25, 2013) (Dkt. No. 431).) No party did so.

5. The Fair Resolution Is to Close the Books on Accounting Year 2006 under the Current RRCA Accounting Procedures While Correcting the RRCA Accounting Procedures for Years Subsequent to 2006.

The only remaining question on the Accounting Procedure issue is by what date to make the correction effective. Proceedings under the Court's original jurisdiction "are basically equitable in nature." *Ohio v. Kentucky*, 410 U.S. 641, 648 (1973). Sitting in equity, the Court has ample leeway to fashion a remedy that achieves a fairly balanced result rather

than taking an all-or-nothing approach. *See Hecht v. Bowles*, 321 U.S. 321, 329-30 (1944) (explaining that federal courts sitting in equity should craft remedies in their "sound discretion" with "[f]lexibility rather than rigidity"). As the party who breached the Compact in 2006, Nebraska comes before the Court with less than clean hands in seeking to change the rules for 2006. Some weight can also be assigned to the fact that Nebraska did not even first raise a challenge to the Accounting Procedures until June of 2007, long after the states made all decisions they made in dealing with the 2006 season. It would also overly complicate Kansas' already significant challenge in proving damages for 2006 if its reasonable reliance on the 2006 consumption figures using the current procedures was set aside after its presentation of its damage evidence. For all of these reasons, the Court in exercising its equitable discretion should close the books on 2006 under the existing, mistaken procedures.

At the same time, as explained in the prior sections of this Report, it is clear that there is an error that should be reformed going forward. Nothing Nebraska has done warrants a permanent loss of the opportunity to align the effect of the Accounting Procedures with the parties' clear intent. Kansas, too, opted to parry rather than address straightforwardly Nebraska's underlying complaint, claiming not to see the error without ever actually analyzing whether Nebraska was being charged with the consumption of

imported water, proposing a metric by which to measure any change only to later use Nebraska's attempt to meet that metric against Nebraska, and criticizing proposed solutions without advancing any concrete alternative that would correct the error.

On this record, closing the books on 2006 under the current Accounting Procedures, while declaring them nevertheless mistaken and reformed for subsequent years seems most fair.

B. The Harlan County Lake Evaporation Issue

Harlan County Lake (sometimes referred to as Harlan County Reservoir) is a federally managed reservoir located in Nebraska. The lake gathers and stores water for release back into the Republican River during irrigation season for diversion through the Courtland Canal to the Kansas Bostwick Irrigation District ("KBID") and through the Superior Canal to the Nebraska Bostwick Irrigation District ("NBID"). (*See* K80 at KS1323; K3). Under the Compact, the evaporation of water from Harlan County Lake is a Beneficial Consumptive Use of water. *See* Compact art. II. In adopting the Accounting Procedures, the states have agreed that that evaporation from Harlan County Lake "will be charged to Kansas and Nebraska in proportion to annual diversions made by the [KBID] and the [NBID] during the time period each year when irrigation releases are being

made from Harlan County Lake." (FSS app. C at C32-34.)

It is undisputed that during the period of time when irrigation releases were being made from Harlan County Lake in 2006, no diversions were made by NBID. (*See* Tr. at 428 (Barfield)). Rather, in an attempt to mitigate the extent of its overconsumption of water in 2006, the state of Nebraska entered into an agreement with NBID pursuant to which NBID forewent its right to make the diversions during that season and also surrendered all rights to the storage supply in Harlan County Lake so that the supply could be released for the benefit of Kansas. (Dunnigan Direct at ¶ 26; N4002 at 1-3 of 60.)

Under the plain language of the Accounting Procedures quoted above, 100% of the total net evaporation from Harlan County Lake for 2006 would normally be charged to Kansas. Kansas, however, recoiled at this conclusion, triggering another source of impasse on closing the accounting books for 2006. (Barfield Direct at 28; N8005 at 21 of 49.) Kansas tenders three arguments in support of its position that the Harlan County Lake evaporation during 2006 should still be split between the two states notwithstanding the absence of any relevant diversions by NBID.

Kansas relies, first, on an exception in the Accounting Procedures to the general rule that allocation of Harlan County Lake evaporation be charged

on the basis of proportional annual diversions. That exception states as follows:

> In the event Nebraska chooses to substitute supply for the Superior Canal from Nebraska's allocation below Guide Rock in Water-Short Year Administration years, the amount of the substitute supply will be included in the calculation of the split as if it had been diverted to the Superior Canal at Guide Rock.

(FSS app. C at C34.) The solecistic combination of the infinitive "to substitute" followed by the prepositions "for" and "from" rendèrs the sentence difficult to parse, as the drafters clearly could not have meant that Nebraska would substitute a supply for a canal. *See* H.W. Fowler, *A Dictionary of Modern English Usage* 599 (2d ed. 1965). In context, it is likely that the drafters had in mind a scenario in which Nebraska foregoes diversions into the Superior Canal, while replacing that foregone supply with supply obtained from its allocation below Guide Rock. And this is more or less how Kansas seems to read the sentence, albeit by employing "substitute" as a transitive form of "replace." (*See* Kansas' Brief re Amount of Nebraska's Exceedance at 11, *Kansas v. Nebraska*, No. 126 Orig. (June 15, 2011) (Dkt. No. 32) ("to substitute its storage supply with water from below Guide Rock").)

In any event, no matter how one reasonably construes the "substitute supply" exception, Kansas points to no facts that would trigger an apportionment to Nebraska of any portion of the Harlan County

Lake evaporation. The best Kansas can do is point to a letter dated May 1, 2006, from the Acting Director of Nebraska's Department of Natural Resources, Ann Bleed. (K59.) In this letter, Nebraska formally notified Kansas that Nebraska would purchase from Nebraska Bostwick Irrigation District its right to approximately 10,118 acre-feet in storage in Harlan County Lake, and then not use that supply, thereby allowing the supply to be diverted by Kansas at Guide Rock into the Courtland Canal. (*Id.*) In the letter, Ms. Bleed also stated that Nebraska would be "supplementing water for Nebraska Bostwick Irrigation District by providing alternate supplies from below Guide Rock or from outside the Basin." (*Id.* at 1.) Ms. Bleed estimated that this planned supplementation would eliminate the diversion of 5,000 acre-feet that would otherwise have been diverted into Superior Canal for 2006. (*Id.*) And the only specific alternate supply she identified for this foregoing diversion was "groundwater wells located below Guide Rock Diversion Dam." (*Id.*) Hence, Kansas argues, that "alternate supply" identified by Nebraska was a "substitute supply" from below Guide Rock.

Kansas, however, offers no evidence that the planned alternate supply was ever used. (Tr. at 509 (Barfield).) Nor did Kansas make any effort to quantify any alternate (or substitute) supply, if it actually existed. (Tr. at 154-55 (Book).) Kansas' chief engineer, David Barfield, agreed that, to determine whether Nebraska used the supply as predicted in Ms. Bleed's letter, one would look at the groundwater pumping

records for 2006 in the region as compared to prior or comparable years. (Tr. at 425-26 (Barfield).). Those records reflect that the total CBCU from groundwater pumping below Guide Rock during all of 2006 was only 2,341 acre-feet. (C01 at C0444.) Importantly, that amount compares to the 2,800 CBCU from groundwater pumping in the same area during 2005 and 2,268 CBCU in 2004. (*Id.* at C0443-44.) In short, the record of what actually happened is that groundwater CBCU below Guide Rock in 2006 was both quite limited (relative to the size of the foregone Harlan County Lake diversion) and normal as compared to prior years. While increased pumping might only increase CBCU marginally in the year of pumping, there is nothing about this record that would support a finding that there was any materially increased pumping in NBID during 2006. Nor is there any other evidence that would allow Kansas to point to a substitute supply, much less quantify one. As such, the evidence supports the only affirmative testimony on the point, namely, Nebraska Department of Natural Resources director Brian Dunnigan's statement that, based on his review of the data, no "substitute supply" was ever used. (Dunnigan Direct at ¶¶ 3, 27.)

Unable to point to any facts that would allow the Court to find that Nebraska employed a substitute supply within any reasonable interpretation of the Accounting Procedures, Kansas falls back on a more overarching argument that by purchasing and then not consuming NBID's water supply rights during the

2006 irrigation season, Nebraska itself "used" that water supply in order to achieve Compact compliance. However, the argument that not using the water is the same as using the water finds no support in common sense. If "not using" equals "using," then why stop at the allocation of evaporation? After all, Nebraska either uses or does not use the entire supply of the Basin. Were Kansas correct, moreover, the substitute supply exception would have no purpose because, under Kansas' view, it makes no difference whether there is a substitute supply or where the substitute supply comes from. Rather, as Kansas would have it, all it need establish is that Nebraska reduced its "use" for the purpose of achieving compliance. And were that the understanding, then when Kansas' chief engineer learned that Nebraska might not request water from Harlan County Lake in 2006, he would not have immediately presumed (as he did) that Nebraska would not be charged with a share of the lake's evaporation. (Tr. at 430-31 (Barfield); N9129 at 2.)

In any event, "use" is not even the precise term that is pertinent under the parties' agreements. Section IV.A.2.e.1 of the Accounting Procedures requires that evaporation be charged "in proportion to the annual diversions made by the Kansas Bostwick Irrigation District and the Nebraska Bostwick Irrigation District. " (FSS app. C. at C34.) Even if one were to cast common sense aside and treat a "non-use" as a "use," there is no basis for claiming that such a use would constitute a "diversion." And even if

one were to further ignore, as Kansas does, the textual difference between the Accounting Procedures' term "diversions" and Kansas' term "use," the fact remains that the Compact itself employs as the basis upon which it allocates water not the term "use," but rather the term "Beneficial Consumptive Use." *See* Compact arts. II, IV. As previously stated, "Beneficial Consumptive Use" is defined to be uses "by which the water supply of the Basin is *consumed* through the activities of man." *Id.* art. II (emphasis added). Kansas' definition of the word "use" (as being broad enough to include not using the water in order to comply with the Compact) does not fall within this definition of Beneficial Consumptive Use.

The entire structure of the parties' agreement for dealing with Harlan County Lake evaporation also cuts against Kansas' basic notion that there should be some way to charge Nebraska with responsibility for some of the evaporation associated with the Harlan County Lake. Harlan County Lake lies entirely within Nebraska. Under Article XI of the Compact, therefore, all Beneficial Consumptive Use by the United States associated with Harlan County Lake would count against Nebraska's allocation. *See* Compact art. XI(a). And it is undisputed that Beneficial Consumptive Use includes water consumed by evaporation from any reservoir. *See* Compact art. II. The parties have agreed, however, that Kansas, in effect, would get rights to a portion of the water in the reservoir; which means that Nebraska would not use all the available water in the reservoir. Kansas, in

turn, became liable for a proportionate amount of the evaporation in the reservoir; that is to say, all of the evaporation from the water that Nebraska normally does not use. Given this structure, it should hardly be surprising that the parties also agreed that if Nebraska ends up not using any of the water stored in the lake, thereby making it all available for diversion to Kansas, then Kansas would become responsible for all of the associated evaporation. The only exception to this allocation rule applies when Nebraska goes out and obtains a substitute supply for the Harlan County Lake water, and it gets that supply from below Guide Rock.

Finally, as an alternative argument, Kansas also points to a memorandum of agreement between the Nebraska Bostwick Irrigation District and Kansas Bostwick Irrigation District (the "Bostwick MOA"). (K70 (Corrected).) Signed in October of 2000, the Bostwick MOA addresses a variety of issues pertaining to the operation and maintenance of the various water supply works from which the districts benefit, including the Harlan County Dam and Harlan County Lake. Section 2 of the agreement apportioned the Corps of Engineers' operating, maintenance and replacement costs associated with the Harlan County Dam and Harlan County Lake between the two Districts based on their respective diversions. (*Id.* at KS3366.) In 2006, after NBID sold its rights to the subject water supply to Nebraska with knowledge that Nebraska intended not to divert any of the water, NBID entered into Amendment No. 2 with

KBID. Amendment No. 2 provides that NBID would continue to share in the operating, maintenance and replacement costs to the same extent it would have had it diverted its allocated supply into the Superior Canal. (*Id.* at KS4203-05.) Kansas argues that Amendment No. 2 should be read as a waiver by Nebraska of any contention that it should not be liable for evaporative losses because it did not divert Harlan County Lake water during 2006. A better reading of the agreement is exactly to the contrary: KBID and NBID clearly recognized that there was no diversion, and agreed that NBID would nevertheless cover certain expressly specified costs as if there had been a diversion, with no proviso made for allocating evaporation in the same manner.

In sum, there is no support in the evidence or in the language of the parties' agreement to conclude that, having foregone diversions from Harlan County Lake, Nebraska should nevertheless be charged with evaporation from Harlan County Lake. The entirety of the 16,182 acre-feet of evaporation from Harlan County Lake (*see* Stipulation of Overuse at ¶ 2) should be charged to Kansas. As a result, Nebraska's CBCU under the Compact for 2006 should not include any evaporation from Harlan County Lake. Kansas' estimate of Nebraska's overuse in 2006 should therefore be reduced by 8,091 acre-feet.[23]

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[23] The parties have not provided me the evidence necessary to fix precisely the amount of Harlan County Lake evaporation

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C. The Non-Federal Reservoir Evaporation Issue

The Compact states that Beneficial Consumptive Use includes "water consumed by evaporation from any reservoir, canal, ditch, or irrigated area." Compact art. II. The FSS elaborates upon the accounting for evaporation from so-called "Non-Federal Reservoirs." The FSS defines "Non-Federal Reservoirs" as those reservoirs that have a storage capacity of 15 acre-feet or more and that are also not listed in the definition of Federal Reservoirs contained in Section II of the FSS. (*See* FSS at § II.) The FSS expressly specifies how to calculate evaporation from Non-Federal Reservoirs located in an area that contributes to run-off into the Republican River Basin above Harlan County Lake (*see* FSS at § VI.A), but is silent as to those below Harlan County Lake. From that silence arises the states' dispute.

Nebraska has maintained that one must infer from the FSS' silence on accounting for Non-Federal Reservoirs below Harlan County Lake an intent to exclude evaporation from such reservoirs altogether

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that Kansas improperly imputes to Nebraska. Kansas states only that it split the evaporation "based on the long-term average use of water by NBID and KBID" (Kansas Post-Trial Br. (Corrected) at 6, *Kansas v. Nebraska*, No. 126 Orig. (Sep. 25, 2012) (Dkt. No. 385)), without specifying that average percentage. Two Kansas witnesses indicated it was "something close to 50/50." (Tr. at 420-21 (Barfield); *see* Book Direct at 31.) I therefore assume that Kansas imputed 50% of Harlan County Lake evaporation in 2006 to Nebraska.

in Compact accounting. Kansas counters that such an inference cannot be controlling because the Compact itself expressly includes evaporation from "any" reservoir in its definition of Beneficial Consumptive Use.

With the RRCA unable to resolve the dispute by unanimous action, the parties squarely presented the question for non-binding arbitration. The arbitrator framed the issue thusly: "Is the evaporation from Non-Federal Reservoirs below Harlan County Lake required to be included in the Compact accounting?" (J7 at JT3257.) The arbitrator issued his non-binding ruling in favor of Kansas, finding that while the Compact may arguably allow *de minimis* exceptions of small reservoirs, evaporation from any reservoir in excess of 15 acre-feet must be included in the Compact accounting. (*Id.* at JT3257-59.)

Kansas' Petition sought vindication of its position. In an appendix to the Petition, and in an attached statement, Kansas alleged that Nebraska's overuse for 2005 was 42,860 acre-feet. (Petition app. C at ¶ 19, Table 1; Brief in Support of Motion for Leave to File Petition at 11, *Kansas v. Nebraska*, No. 126 Orig. (May 3, 2010) (included in Dkt. No. 1).) In an explanatory note, Kansas explained that Nebraska conceded to an overuse of 42,390 acre-feet, the difference being that Nebraska's number was "without nonfederal evaporation below Harlan County Lake." (*Id.* app. C at ¶ 19, Table 1.)

In its Answer to the Petition, Nebraska simply denied paragraph 19 of the Petition in its entirety. (*See* Answer and Amended Counterclaims at ¶ 19, *Kansas v. Nebraska*, No. 126 Orig. (July 25, 2011) (Dkt. No. 58).) In a brief filed in support of a motion to file counterclaims, Nebraska stated that it did not believe that the issue of evaporation from Non-Federal Reservoirs below Harlan County Lake is "of sufficient magnitude to warrant continued pursuit in this proceeding." (Brief in Support of Motion for Leave to File Counterclaims of Nebraska at 2, *Kansas v. Nebraska*, No. 126 Orig. (May 31, 2011) (Dkt. No. 22).) Rather, Nebraska stated that it wished to leave the issue for later discussion by the parties. (*Id.*) In a subsequent filing, Nebraska stipulated that its overuse in 2005 was 42,860 acre-feet, as alleged by Kansas. (*See* Stipulation of Overuse at ¶ 1.) It now argues that, because of its stipulation, "there is no ongoing controversy about" the subject of evaporation from Non-Federal Reservoirs below Harlan County Lake. (State of Nebraska's Responsive Post-Trial Brief at 20, *Kansas v. Nebraska*, No. 126 Orig. (Oct. 15, 2012) (Dkt. No. 391) (all caps removed).) In short, Nebraska seeks both to moot the issue and at the same time to preserve it as unripe. Kansas disagrees and continues to seek a ruling on the issue so as to put the matter to rest. (*See* Stipulation of Overuse at ¶ 4.)

Certainly settlement is to be encouraged. *See Oklahoma v. New Mexico*, 501 U.S. 221, 241 (1991). At the same time, "the Court does have a serious

responsibility to adjudicate cases where there are actual, existing controversies between the states over the waters in interstate streams." *Id.* (internal quotation marks omitted). Absent resolution of this question now, Kansas cannot reliably know the extent of Nebraska's consumption each year. Nor has Kansas delayed in pressing this issue. Even if the issue had arisen heretofore only as an anticipatory question to resolve a dispute that had not yet arisen in concrete form for any past year, the issue might well provide a proper occasion for the issuance of declaratory relief. *See* 28 U.S.C. § 2201(a). Here, however, the issue was framed concretely in the context of finalizing accounting for the first compliance period, and has ripened further through the formal dispute resolution steps upon which the parties agreed. It poses a straightforward question of contract interpretation, the answer to which requires only a reading of the FSS and the Compact, and which is unaffected by facts peculiar to any one year. There is simply no good reason to allow Nebraska to play coy by acceding to Kansas' position for the 2006 accounting period while simultaneously leaving all subsequent years in doubt.[24]

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[24] In view of Nebraska's concession on the 2005 accounting while maintaining a live controversy concerning Compact interpretation, Kansas perhaps should have sought to supplement its Petition to add a formal claim for declaratory relief *per se*. Instead, in a brief that I required each party to file before discovery proceeded apace, Kansas expressly confirmed that it sought a final resolution of the controversy. (*See* Kansas' Brief

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On the merits of the issue, Kansas is correct. The parties all agree that the FSS must be read as consistent with the Compact. And the Compact makes no exception for these reservoirs from its general mandate that evaporation from "any" reservoir be included as beneficial consumptive use. *See* Compact art. II. Whatever negative inference one might in the abstract draw from the absence of any express provision in the FSS for calculating evaporation from such reservoirs as compared to others, any such inference is overborne by the parties' express agreement that the FSS is not "intended to, nor could [it], change the states' respective rights and obligations under the Compact." (FSS at § I.D.)

Accordingly, the Court should resolve the parties' disagreement regarding the treatment of evaporation from Non-Federal Reservoirs in favor of Kansas. Evaporation from such reservoirs is a Beneficial Consumptive Use under the Compact and should be accounted for as such.

Re Amount of Nebraska's Exceedance at 8-10, *Kansas v. Nebraska*, No. 126 Orig. (June 15, 2011) (Dkt. No. 32).) Given the simple and purely legal nature of the issue, requiring no discovery or evidence, and given that Nebraska has had a full and fair opportunity to argue the issues, I find the absence of a formal supplemental pleading to be of no significance. Simply put, if I required Kansas to file such a supplemental pleading now, nothing would be achieved other than delay.

D. The Average Versus Total Overuse Issue

Prior to 2003, the states determined compliance for each year by comparing the allocation for that year with the usage for that year. (*See* Second Report at 49.) In the FSS, the parties opted to change that practice in favor of determining compliance for each year based on a five-year running average of annual use as compared to annual allocations or, in the case of "Water-Short Year Administration" as defined in Article V.B.1.a of the FSS, a two-year running average.[25] (FSS at §§ IV.D, V.B.2.e.i.) Averaging was intended to give "the states the ability to manage the water of the Basin with greater predictability,

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[25] The text of the FSS itself merely states in Section IV.D and V.B that "all Compact accounting shall be done on a five-year running average in accordance with the provisions of the RRCA Accounting Procedures" except during Water-Short Year Administration, when the key variables are to be "calculated on a two-year running average . . with any Water-Short Year Administration year treated as the second year of the two-year running average and using the prior year as the first year." (FSS at §§ IV.D, V.B.2.e.i.) In turn, Section III.E of the RRCA Accounting Procedures, captioned "Calculation to Determine Compact Compliance Using Five-Year Running Averages," states in relevant part that the "results for the current Compact accounting year as well as the results of the previous four accounting years and the five-year average of these results will be displayed in [a specified format]." (FSS app. C at C21-22.) Section III.H of the Accounting Procedures, applicable to Water-Short Year Administration, requires use of a different specified tabular format, which covers only two years. (*Id.* at C24-25.) There is also an option, not separately relevant here, for a three-year running average alternative test. (FSS at § V.B.2.e.ii.)

efficiency, and flexibility." (Second Report at 51-52.)[26] Averaging did so, at least in part, by allowing states to manage groundwater and surface water depletions together. (*See* Second Report at 50.)[27] The shorter averaging period adopted for Water-Short Year Administration was intended to "prevent an upper State from heavily overusing in a dry year (when all the States needed the water the most)."[28] (Second Report at 49-50.) The employment of multi-year running averages to measure annual compliance was presented by the parties and accepted by the Special Master, and presumably the Court, as consistent with the Compact because the allocations in the Compact were themselves derived from multi-year averages. (*See* Second Report at 51.)

The states agreed to use 2003 through 2007 as the first five-year period to be averaged in order to

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[26] According to the parties, "Averaging provides greater predictability and flexibility in the use of water." (J6 at JT3063.)

[27] As the parties asserted, "Recognizing that groundwater pumping may cause stream depletions a year or more after the pumping occurs, the use of averaging in the accounting allows the states to manage groundwater and surface water together." (J6 at JT3063-64.)

[28] The parties explained the decision to adopt a two-year test as follows: "And the concern there, particularly from Kansas's standpoint was if you are still in a five-year average, you may have two of these water-short years – if Nebraska used heavily in these two short years, get a lot of rain in year three or in year four, all of a sudden we're in compliance on a five-year basis, but there were two very short years that Nebraska was using more and Kansas was using less." (J6 at JT3098.)

determine Normal Year compliance. (*See* FSS app. B.) They also agreed to use 2005 to 2006 as the first two-year period to be averaged to determine Water-Short Year Administration compliance (should 2006 be a Water-Short Year). (*See id.*) The year 2006 turned out to be a Water-Short Year Administration year (Barfield Direct at 26); hence, Nebraska needed to achieve compliance in 2006 based on the average results of 2005 and 2006 (*See* FSS app. B).

Because Nebraska's use exceeded its Compact allocation both in 2005 and in 2006, Nebraska does not dispute that it failed the FSS' compliance test and thereby breached its obligations under the Compact in 2006. The parties nevertheless disagree on how to calculate the extent of Nebraska's non-compliance for 2006; *i.e.*, by what amount of water should Nebraska be found to have exceeded its rights under the Compact as implemented and administered by the FSS? Kansas contends that Nebraska's noncompliance with the Water-Short Year Administration requirements in 2006 renders Nebraska liable for "the sum of the annual overuse amounts" in the two years, which Kansas asserts to be 42,860 acre-feet for 2005 and 36,100 acre-feet for 2006. (K5 at 1, 12.) Nebraska contends that because the FSS makes 2006 the first year for measuring compliance, Nebraska bears no liability for its admitted 2005 exceedance except to the extent that exceedance increased the overall average for 2005 and 2006 combined. For the following reasons, Kansas is correct.

1. Absent Agreement to the Contrary, the Scope of the Remedy Should Accord With the Scope of the Breach.

In framing this issue, it is helpful to begin with what is conceded: Nebraska was required to comply with the Water-Short Year Administration requirement in 2006; its compliance was to be measured by its 2005 and 2006 average usage; it exceeded its 2005 annual allocation by 42,860 acre-feet; it therefore needed to use 42,860 less than its allocation in 2006 in order to comply in 2006; and it instead exceeded its 2006 annual allocation. Further, as explained in Section VI.B of this Report, I have found that the amount by which Nebraska exceeded its annual allocation in 2006 was 28,009 acre-feet.[29] Accordingly, except to the extent a party challenges the precise determination of the amount of the 2006 overuse, all parties agree that, given its 2005 usage, to comply in 2006 Nebraska would have had to use 70,869 fewer acre-feet than it actually used. Put in simple terms, if asked what it did to breach the Compact in 2006, Nebraska would most forthrightly say that during the compliance measurement period (2005 and 2006) it

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[29] I reach this number by subtracting 8,091 acre-feet (one-half of the Harlan County Lake evaporation) from Kansas' overuse calculation of 36,100 acre-feet for 2006.

used 70,869 more acre-feet of water than it was entitled to use.[30]

The scope of the breach defines the scope of the remedy. *See Texas v. New Mexico*, 482 U.S. 124, 129 (1987) ("[P]arties must perform today or pay damages for what a court decides they promised to do yesterday and did not."). Absent agreement to the contrary, Nebraska should therefore be liable for the full amount of water that it used in excess of the maximum amount it could have used without failing to satisfy the first two-year compliance test in 2006. That amount is 70,869 acre-feet.

2. There Was No Agreement to the Contrary.

Nebraska argues that there was, in fact, an agreement that absolves it at least in part from its overuse. It argues that the inclusion of stream flow depletions caused by groundwater pumping as Beneficial Consumptive Use under the Compact required a period of adjustment, and that the FSS therefore

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[30] To be clear, because Appendix B of the FSS sets 2006 as the first year for Water-Short Year Administration compliance, the only purpose for the 2005 calculations is for calculation of the corresponding two-year running averages for 2006. (*See* FSS app. B.) Nebraska's compliance with the Water-Short Year Administration requirements in Section V.B.2.a. of the FSS in 2005 would require calculation of two-year running averages using values from 2004 and 2005, but is not relevant because the FSS plainly established 2006 as the first year for Water-Short Year Administration compliance.

created a "grace period" prior to 2006 within which to make that adjustment. So, Nebraska reasons, it could not be liable directly for any noncompliance in 2005, and its 2006 noncompliance should be deemed limited to the average noncompliance of the two years. For three reasons, this argument fails.

a. There is no express language in the FSS absolving a state for any portion of its overuse post-2002.

There is no language in the FSS that states anything to the effect that Nebraska would be absolved in substantial part for any Compact exceedances between the approval of the 2003 settlement and 2006. To the contrary, while the FSS waived claims "with respect to activities or conditions occurring before December 15, 2002" (FSS at § I.C), it provided that "[w]ith respect to activities or conditions occurring after December 15, 2002, the dismissal [of the 1999 action pursuant to the FSS] will not preclude a State from seeking enforcement of the provisions of the Compact. " (FSS at § I.D). The FSS further stipulates that it is "not intended to change the States' respective rights and obligations under the Compact." (*Id.*)

In an effort to infer a partial absolution, Nebraska points to Section I.B of the FSS, which provides that the "States shall implement the obligations and agreements in this Stipulation in accordance with the

schedule attached as Appendix B." (FSS at § I.B.) Appendix B, a two-page "Implementation Schedule," reads in relevant part:

First year Water-Short Year Administration compliance	2006 (if Water-Short Administration Year, 2-year running average is 2005-2006)
First normal year compliance	2007 (5-year running average from 2003-2007)

(FSS app. B.) Certainly this schedule postponed the day of reckoning, thereby providing Nebraska with an opportunity to adjust its practices both to achieve compliance by offsetting early year overuse with later year underuse (Tr. at 827-29 (Pope); N8005 at 14 of 49) and to deal with the lag effect from groundwater pumping that occurred prior to 2003 (Tr. at 631-32 (Schneider)). The delay in compliance measurement was also apparently necessary to acquire the data needed to implement the FSS, including certifying irrigated acres and metering wells. (Tr. at 1331-32 (Clements).) It is equally certain that the schedule postponed until 2006 any need to satisfy a two-year running average test, or the sub-basin allocation specifications created by the FSS for Water-Short Year Administration. In that sense, Nebraska did receive a "grace period" of several years during which it was not subject to the two-year averaging and more specific sub-basin limitations implemented for the first time by the FSS. Kansas disputes none of that. It is an entirely different proposition to suggest that,

in the event of noncompliance on the applicable day of reckoning, the breaching party would somehow be absolved of some portion of the very overuse that resulted in noncompliance. There is nothing in the Implementation Schedule to support that proposition. Further, reading that proposition into the Implementation Schedule would run counter to the FSS' provisions regarding the extent to which liability is and is not released. (FSS at §§ I.C, D.) *See also* Restatement (Second) of Contracts § 203(a) (an interpretation that gives "effective" meaning to all terms preferred over an interpretation that does not); Restatement (Second) of Contracts § 202(2) (a contract need be "interpreted as a whole.").

Nebraska relies also on the language in subsection IV.D of the FSS stating that "all Compact accounting shall be done on a running average in accordance with the provisions of the RRCA Accounting Procedures." (FSS at § IV.D.) This means, says Nebraska, that the amount of liability, not just the determination of compliance, must also be calculated using running averages. But, the RRCA Accounting Procedures themselves expressly apply only to "supply, allocations, use and compliance." (FSS app. C at C6.) The Accounting Procedures simply have no provisions at all directed at calculating the extent of liability. And, even if a determination of the extent of liability is "Compact accounting," and must be done on a running average basis, there is nothing in the language (or the math) that would preclude using the average and then multiplying by two when applying a

two-year test, which product would equal the sum of the annual amounts.

More importantly, it is simply not reasonable to glean from the sparse language of the FSS' Implementation Schedule and the Accounting Procedures something so substantial as a major absolution from liability for using materially more water than allowed by the Compact. *Cf. Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 468 (2001) (declining to find "elephants in mouseholes"); *Oklahoma v. New Mexico*, 501 U.S. 221, 247 (1991) ("Had the Compact's drafters intended to limit New Mexico's free and unrestricted use of the Canadian River waters , they would certainly have done so more directly.") (Rehnquist, C.J., concurring in part and dissenting in part). This observation applies with special force to an agreement that has two sections specifically devoted to addressing the extent to which any liability is and is not released. (*See* FSS at §§ I.C, D.) *See* Restatement (Second) of Contracts, § 203(c) ("[S]pecific terms and exact terms are given greater weight than general language."); 11 Williston on Contracts § 32:10 ("When general and specific clauses conflict, the specific clause governs the meaning of the contract.").

Accordingly, I find no basis in the language of the parties' agreement to conclude that Nebraska has been absolved of any part of its overuse.

b. Nor does any evidence outside the corners of the parties' agreements support Nebraska's position.

Given the absence of language in the FSS supporting Nebraska's position, resort to extrinsic evidence could well be seen as unnecessary. *See Oklahoma v. New Mexico*, 501 U.S. 221, 245 (1991) ("Accordingly, where the terms of the compact are unambiguous, this Court must give effect to the express mandate of the signatory States."). In any event, the extrinsic evidence supports the conclusion I have reached. In tendering the FSS to the Court for approval after hearing the parties' explanations, Special Master McKusick cited three reasons for the adoption of running averages: (1) to better manage the delayed impact of groundwater pumping on stream flow, (2) to account for changes in stream flow caused by new practices in federal reservoirs, and (3) to maximize the states' ability to manage water sources with greater predictability, efficiency, and flexibility. (*See* Second Report at 49-52.) This list, by omission, belies any suggestion that the adoption of running averages was aimed at achieving any other purpose, much less the creation of a partial amnesty.

The running average accomplished all of the purposes cited in the Second Report by allowing the states to balance positive deviations in one year with negative deviations from another. As an upstream state, Nebraska gained much with this flexibility, especially in view of the fact that the Compact otherwise

gave no credit for underuse.[31] As discussed above, the averaging also allowed Nebraska time to catch up and compensate for the anticipated higher usage it might experience in the first year or two as groundwater pumping became chargeable to it. Without averaging, it likely would have been incapable of avoiding immediate violations. With averaging, it secured the possibility of eliminating such violations by achieving offsetting reductions during ensuing years had it chosen to be more ambitious in its efforts to reduce usage.

c. Nebraska's position also fails the common sense test.

A contract should not be given a reading that would result in absurd or illogical results. *See* Restatement (Second) of Contracts § 203(a) (an interpretation that yields a "reasonable" meaning is preferred). *See also Kellogg Co. v. Sabhlok*, 471 F.3d 629, 636 (6th Cir. 2006) ("[C]ontracts must be construed consistent with common sense and in a manner that avoids absurd results."). Adopting the position of Nebraska would violate this principle of contract interpretation.

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[31] But for the FSS, if Nebraska used 10,000 acre-feet less than its allocation in 2005 and 10,000 more than its allocation in 2006, it would have been liable for a breach in 2006, with no credit for the 2005 underuse.

A simple example shows why Kansas must be correct and Nebraska wrong. Imagine that Nebraska's allocation for each of 2005 and 2006 was 100 acre-feet of water and that at the end of 2005 Nebraska estimated that it had used 110 acre-feet of water (*i.e.*, 10 acre-feet too much). If Nebraska officials then asked themselves at that time what was the most water that they could use in 2006 to avoid breaching the Compact as implemented through the FSS, the answer would have been 90 acre-feet of water, so as to achieve a two-year running average of 100. If Nebraska then instead used 110 acre-feet again in 2006, it would have breached the Compact by using 20 more acre-feet of water than it should have used – not 10 acre-feet.

To conclude otherwise would be to establish a perverse incentive that becomes apparent once one recognizes that the remedy for a breach can be measured in volumes of water. *See Texas v. New Mexico*, 482 U.S. 124, 127-28 (1987). Sticking with the above example, imagine that Nebraska officials were contemplating usage projections in late 2006, and deciding whether to eliminate pumping and cut off diversions to achieve compliance. Under Nebraska's view, those officials would have the option of cutting back from projected usage by 20 acre-feet at the end of 2006 (so as to comply) or simply foregoing only 10 extra acre-feet after January 1 as a remedy for the failure to comply in 2006. In this manner, the mismatch between what Nebraska concedes it needs to

do to achieve compliance and the remedy it proposes becomes apparent.

Nebraska counters this appeal to common sense by suggesting that this measure of damages will expose it to harmful double-counting. Imagine, for example, that 2007 turned out to be subject to Water-Short Year Administration, with an exceedance by Nebraska. Nebraska argues that, unless its 2006 overuse is determined to be the average overuse of 2005 and 2006, rather than the total overuse, then perhaps its overuse for 2007 would be the total overuse for both 2006 and 2007 – subjecting it to double-counting for the overuse in 2006. This example, while apparently reflecting a result for which Kansas advocates in another context, ignores the fact that the accounting need recognize the practical implications that flow from deciding to use a running average measurement. Certainly the choices must not be limited to under-counting or double-counting.

The parties' disagreement arises in large part because they likely did not work through in 2003 the exact mechanics of starting to use a running average, much less starting what could turn out to be two overlapping running averages. One easily understands annual measurement. And one readily understands how a running average works when up and running. But the initial transition from an annual measurement to a running average measurement can be tricky because the initial years have no full assortment of prior years with which to be retrospectively combined. In a perfect world, the parties would

have agreed upon a series of concrete examples showing how to measure remedy, how to use years falling within two-year and five-year averages combined, how to account for remedial awards in calculating the averages for later years, and so on.

The absence of demonstrative examples in the FSS nevertheless does not belie the conclusion that that any resolution of the transition intricacies should accord with the principle that, absent an effective agreement to the contrary, any state that consumes more water than it is entitled to use under the Compact should be liable for no less (and no more) than the amount of its total overuse. The running averages were intended to achieve their stated purpose of allowing each state the flexibility of achieving compliance on a net basis over several years. They were not intended to increase or decrease the extent of liability for any noncompliance. Here, even Nebraska must concede that, had it performed its obligation under the Compact, as measured in 2006, it would have used more than 70,869 fewer acre-feet of water than it actually used. The scope of the remedy should therefore accord with the scope of this breach, thereby bringing Nebraska's account even for 2005-2006.

E. The Contempt Issue

1. A Finding of Contempt Is Not Available Because There Is No Order that Nebraska Could Have Disobeyed.

In its petition, Kansas attempts to treat Nebraska's 2006 noncompliance as conduct in contempt of a decree of this Court. (Petition at ¶¶ 18, 21, 27.) The decree to which Kansas points is the May 19, 2003 Decree issued in the earlier round of litigation between the parties. (*Id.* at ¶ 12.) Kansas argues that "the parties' entire purpose in securing entry of the Decree was to add the Court's imprimatur and its power to sanction non-compliance with the FSS and the Decree. " (Kansas' Motion for an Order Holding Nebraska in Contempt at 12, *Kansas v. Nebraska*, No. 126 Orig. (May 15, 2012) (Dkt. No. 212).)

The problem for Kansas in seeking to secure a finding of contempt is that there is no language in the actual Decree ordering any party to comply with either the Compact or the FSS. Kansas correctly concedes that in order to secure a finding of contempt, one must show by "clear and convincing evidence" that, among other things, there has been a violation of a court order "requir[ing] certain conduct by the [party being charged with contempt]." (*Id.* at 9 (quoting *American Airlines, Inc. v. Allied Pilots Ass'n*, 228 F.3d 574, 581 (5th Cir. 2000).) As the Court has observed, to be enforceable in contempt, an order of the Court must state in specific terms the acts required or prohibited by the parties. *See Int'l*

Longshoremen's Ass'n v. Phila. Marine Trade Ass'n, 389 U.S. 64, 76 (1967). Here, the Decree did nothing beyond approving the FSS, dismissing with prejudice certain claims, and recommitting the action to Special Master McKusick to decide procedural questions that might arise in connection with adoption of the groundwater model. There is simply nothing in the language of the Decree that Nebraska could have violated, much less language that Nebraska did violate.[32]

Kansas nevertheless argues that the Court should look beyond the four corners of the Decree into the "surrounding circumstances and the intent of the parties." (Kansas' Motion for an Order Holding Nebraska in Contempt at 11, *Kansas v. Nebraska*, No. 126 Orig. (May 15, 2012) (Dkt. No. 212).) Those circumstances, Kansas argues, show that the parties "bargained for the FSS to be embodied in an order of the Court." (*Id.* at 12.) Arguably, this was indeed so, at least initially. In executing the FSS subject to Court approval, the parties initially agreed upon a proposed form of order that was captioned "Consent Judgment" and which stated that the FSS "is approved *and adopted*." (J1 at JT48 (emphasis added).)

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[32] For this reason, the Decree at issue is easily distinguishable from the decree in *Wyoming v. Colorado*, 309 U.S. 572 (1940), a case on which Kansas relies. In that case, the Court acknowledged the possibility of finding Colorado in contempt for violating a decree that plainly embedded the allocations and injunction in the decree itself. *Id.* at 581-82.

Had the Decree itself so read, perhaps one might argue that by "adopting" the FSS, the Court effectively incorporated it into the Decree.

That proposed order, however, is not what the Court ratified. When the FSS was presented to Special Master McKusick, he observed that approval and adoption of the FSS was not the same as incorporating the FSS into the Court's Order. (J6 at JT3076.) No party challenged that interpretation, or informed the Special Master that the intent was to secure incorporation of the FSS into the Decree. With the acquiescence of all parties (*see*, *e.g.*, J6 at JT3112), Special Master McKusick then revised the proposed order by deleting the words "and adopted," thereby eliminating any potential that the Decree might be read as incorporating the FSS (FSS app. A; J4 at JT2766.) He also changed the title from "Consent Judgment" to "Decree." (J4 at JT2766.) On this record, if I were to accept the dubious assumption that the Court need look outside the language of this Decree, I would simply find yet another basis for concluding that Nebraska's violation of the FSS and the Compact is not a violation of the Decree.

If Nebraska is to be held liable in this action, it must be held liable for violating the Compact as interpreted and implemented by the FSS, not for violating any court order. Similarly, any remedy to be awarded should be determined by principles applicable to breaches of a compact, not by principles applicable to violations of court orders.

2. Dismissal of the Petition for Contempt Does Not Divest the Court of Jurisdiction.

My conclusion that Kansas' request for a finding of contempt should be rejected in view of the absence of any order that Nebraska did or even could have violated causes me to raise, *sua sponte*, a question of jurisdiction. Rather than seeking to initiate a new original action with a complaint, Kansas sought and secured an order allowing it to file a petition in the pre-existing original action bearing docket number 126. (*See* Petition.) Were this an action between two private parties in a United States District Court, a determination that the facts alleged gave rise at most to a claim for breach of a settlement agreement rather than violation of a court decree would require that there be an independent basis for jurisdiction for a new action, rather than piggybacking on the jurisdiction of the prior dismissed action. *See Kokkonen v. Guardian Life Ins. Co. of Am.*, 511 U.S. 375, 379-82 (1994). This suggests that Kansas' improper continuance of the original docket might have created a jurisdictional defect if no independent jurisdiction exists.

Here, however, the Court certainly has independent original jurisdiction to hear an action between two states arising out of a significant breach of a Compact between the states. U.S. Const. art. III, § 2, cl. 2. It would therefore seem that there is no lack of subject matter jurisdiction. Rather, there would appear to be at most a question as to whether a new

docket number should have been assigned to the action. On matters of such technical pleading detail, the Court has previously observed, albeit only in *dicta*, an inclination toward a practical approach. *Nebraska v. Wyoming*, 507 U.S. 584, 591 (1993) (declining to restrict the scope of the litigation to the scope of the pleadings where "nothing would prevent Nebraska from submitting a new petition if [the Court] deemed the original one deficient").[33] There is therefore no reason to recommend dismissal because of Kansas' procedural error.

F. The Remedy Issue

The Court's aim in an original action of this type is to find "a fair and equitable solution that is consistent with the Compact terms," *Texas v. New Mexico*, 482 U.S. 124, 134 (1987), as an original action is "basically equitable in nature," *Ohio v. Kentucky*, 410 U.S. 641, 648 (1973).

> The essence of equity jurisdiction has been the power of the Chancellor to do equity and to mould each decree to the necessities of the particular case. Flexibility rather than rigidity has distinguished it. The qualities of mercy and practicality have made equity the instrument for nice adjustment and reconciliation between the public interest and

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[33] This same consideration informs my judgment concerning the technical pleading arguments addressed in Sections VI.A.3.b.(i) and VI.C of this Report.

> private needs as well as between competing private claims.

Hecht v. Bowles, 321 U.S. 321, 329-30 (1944). "Moreover, equitable remedies are a special blend of what is necessary, what is fair, and what is workable. In equity, as nowhere else, courts eschew rigid absolutes and rules and look to the practical realities and necessities inescapably involved in reconciling competing interests." *Franks v. Bowman Transp. Co.*, 424 U.S. 747, 790 (1976) (internal quotation marks and citations omitted). As a result, the fashioning of an equitable remedy "rests entirely in judicial discretion [though] not arbitrarily and capriciously, and always with reference to the facts of the particular case." *Texas v. New Mexico*, 482 U.S. 124, 131 (1987) (quoting *Haffner v. Dobrinski*, 215 U.S. 446, 450 (1910)).

To inform the exercise of that discretion, I begin by reviewing in Section VI.F.1, immediately following, the nature and quality of Nebraska's efforts to comply with the Compact leading up to and following its failure to satisfy the 2006 compliance test. Review of those efforts is relevant to determining both the proper measure of damages and whether there is a need for an injunction. Next, in Section VI.F.2, I explain why the payment of money rather than the delivery of water provides the proper form of an award to Kansas on account of Nebraska's breach of the Compact. In Section VI.F.3, I then explain why the amount of the award may take into consideration both the evidence of harm to Kansas and the evidence

of gain by Nebraska. In Sections VI.F.4 and 5, I analyze that evidence of loss and gain, and then in Section VI.F.6 settle upon the amount of the recommended award. Finally, in Section VI.F.7, I explain why no injunction should issue.

1. Nebraska's Evolving Approach to Compact Compliance

As the following discussion details, Nebraska's compliance efforts until recently have been both inadequate and reluctant, resting in great part on wishful thinking coincident with a hesitance to take firm action that would prove sufficient to meet the challenges of foreseeably varying conditions in the Basin. Now, however, Nebraska appears to have in place the tools necessary to achieve compliance as long as it is willing to use those tools conscientiously.

a. Prior to 2007

As groundwater pumping increased during the 1990s under the control of locally governed jurisdictions, Nebraska took few meaningful steps to control it. Instead, Nebraska persisted in maintaining that the depletion of surface flow in the Basin's rivers caused by groundwater pumping was somehow not covered by a Compact that expressly applied to all acts of man that consumed the virgin water supply of the Basin. After the Court rejected Nebraska's position in 2002, Nebraska had no choice but to begin to

confront the problem it had created for itself and for Kansas through unrestrained groundwater pumping.

It was "well understood" at the time of the signing of the FSS that Nebraska would have to curtail its consumption to achieve compliance. (Tr. at 828-29 (Pope).) In Nebraska's own words, it was "well known" that Nebraska could not come into compliance with the Compact "without a sufficient 'grace period' designed to facilitate development of intrastate rules that would control such consumption." (Nebraska's Post-Trial Brief at 47, *Kansas v. Nebraska*, No. 126 Orig. (Sep. 24, 2012) (Dkt. No. 383).) As explained in greater detail in Section VI.D of this Report, above, the FSS created no such "grace period" from Compact compliance *per se*. It did, though, adopt multi-year running averages as the means of measuring compliance. Nebraska thus obtained for itself the possibility of offsetting its likely immediate annual over-consumption by taking steps to insure underconsumption in subsequent years. Nebraska also well understood at the time that the effects on stream flow of reducing groundwater pumping are often delayed. (*See* Tr. at 220-21 (Book) (discussing lag effect of groundwater pumping); Tr. at 630-31 (Schneider) (same); *see also* Second Report at 49-50.) Again, in Nebraska's words, "much of the impact from groundwater pumping is not felt on the streams in the year in which pumping occurs." (Nebraska's Post-Trial Brief at 46, *Kansas v. Nebraska*, No. 126 Orig. (Sept. 24, 2012) (Dkt. No. 383).) Thus, to the extent Nebraska wanted to achieve compliance by reducing consumption

caused by groundwater pumping sufficient to offset anticipated 2003 over-consumption, it needed promptly to "facilitate development of intrastate rules that would control such consumption." (*Id.* at 47.)

Short-sightedness and inertia trumped whatever tolerance there might have been to incur present costs to ensure future compliance. Even as it bound itself to the terms of the FSS and joined in seeking Court approval of its terms, Nebraska failed to act either promptly or effectively in enacting intrastate rules that would limit consumption of the Basin's virgin water supply to the amounts allowed under the Compact. In 2004, Nebraska's legislature did amend the Nebraska Groundwater Management Protection Act (the "NGMPA"), Neb. Rev. Stat. ch. 46, art. 7. (Tr. at 1339 (Clements).) The amended NGMPA required the Nebraska Department of Natural Resources ("DNR") and the Natural Resource Districts ("NRDs") to develop Integrated Management Plans ("IMPs") "sufficient to ensure that the State will remain in compliance with any applicable interstate water compact or decree or other formal state contract or agreement pertaining to surface water or groundwater use or supplies." Neb. Rev. Stat. § 46-715(4)(b). The first IMPs, however, were clearly not sufficient, either in timing or substance. They did not go into effect until 2005. (*See* Fanning Direct at ¶ 39; Tr. at 979 (Fanning); Tr. at 1339-40 (Clements).) When they did go into effect, they simply required a 5% reduction in groundwater pumping from a representative baseline period of 1998-2002 (Dunnigan Direct at

¶ 20; Fanning Direct at ¶ 39), without any assurance that such a reduction would prove to be sufficient. The IMPs did purport to limit each District's consumption to a specified share of Nebraska's Compact consumption allocation (Dunnigan Direct at ¶ 20), but contained no mechanism for pre-determining or actually achieving such a limit.

Mother Nature then provided the test that exposed the deficiencies in Nebraska's compliance efforts. From 2002 to 2006, Nebraska's available water supply was greatly reduced as a result of very dry years in 2002 and 2003. (N2001 at 69 of 168, Figure C4; N8401 at 29; N8402 at 25; N8403 at 25 of 70; N8404 at 24-25 of 71; N8405 at 25 of 70; K24 at KS780.)[34] In 2003, Nebraska exceeded its Compact allotment by 25,420 acre-feet. (K24 at KS763.) By the spring of 2004, Nebraska knew precisely by how much it had exceeded its Compact allotment for 2003, and thus knew that in order to satisfy the five-year compliance test that it would eventually be called upon to meet, it needed to find a way to use less than its Compact allotment on average over the coming years. Instead, in 2004, Nebraska again exceeded its Compact allotment by a total of 36,640 acre-feet. (*Id.*) In the fall of 2004, the situation was sufficiently serious that the Department of Natural Resources sent a letter to the Lower Republican Natural

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[34] Storage in Harlan County Lake did not rebound until after a very wet year in 2007. (N8406 at 23 of 68; N8407 at 25 of 68.)

Resources District stating, "[i]f it remains dry it will be critically important to control our water use in 2005 to avoid the need for significant cutbacks in 2006." (K58.) After again exceeding its Compact allotment in 2005, that time by 42,860 acre-feet (*see* Stipulation of Overuse), Nebraska entered 2006 facing the added challenge manifest in the designation of 2006 as Water-Short Year Administration under Section V.B of the FSS. That designation both effectively reduced Compact allotments and meant that the end of 2006 would provide the first actual day of reckoning in the form of a compliance assessment. Nebraska witnesses acknowledged that "by 2006, we could clearly see that we had not done enough" and were aware that they would have to underuse in 2006 in order to be in compliance. (Tr. at 1333 (Clements).) Nebraska also knew it had not taken the steps it needed to take in order to underuse in 2006 if that year turned out to be a water-short year. (Tr. at 1333-36 (Clements).) To its credit, Nebraska spent $3.5 million in 2006 to purchase from surface water users their rights to flow and storage of approximately 23,518 acre-feet in order to reduce the extent of noncompliance. (K116 at 3; N4002 at 1-18 of 60.) The net result of these efforts, however, fell woefully short.

The shortage in water supply between 2002 and 2006 allows Nebraska to say that it suffered some bad luck, and perhaps might have complied with the Compact had it received good luck in the form of wet years. The fact remains, though, that prior experience

rendered it foreseeable that there would likely be both dry and wet periods, and Nebraska took steps adequate, at most, only for the latter.

Much of Nebraska's struggle with compliance arises from the fact that the Nebraska legislature made a policy decision – as it was entitled to do – "to maximize the amount of local control over ground water resources." (Dunnigan Direct at ¶ 15 (citing Neb. Rev. Stat. § 46-702).) At the same time, the state (and not the local entities that controlled groundwater resources) remained responsible for Compact compliance. (*Id.*). In this manner, Nebraska created a decision-making process in which the entities and persons who principally regulated how much water to pump from the ground were not the entities or persons who would bear the full ramifications of violating the Compact. To be specific, the irrigators who largely comprised the boards of the local irrigation districts (Tr. at 1301-02 (Clements)) would be among the immediate beneficiaries of groundwater pumping without being held directly responsible for any Compact exceedances that might result from that pumping. By thus adhering to a structure that only loosely bound key decision makers to the dictates of the Compact, Nebraska failed to make available to itself all the tools necessary to ensure compliance in the face of dry weather. Nebraska pretty much concedes that this is the case. (*See* Nebraska's Post-Trial Brief at 15 n.4, *Kansas v. Nebraska*, No. 126 Orig. (Sept. 24, 2012) (Dkt. No. 383).)

The attenuated nexus between the decision whether and how much to pump and the disincentives for pumping too much was likely weakened further by the lag time that generally exists between groundwater pumping and the resulting depletion of stream flow. All things being equal, groups of people may find it difficult to weigh future costs against present benefits accurately, especially where the future costs are not both imminent and certain. Nebraska's pursuit of a course of action that would achieve compliance only if the weather cooperated suggests that it was not up to the task of overcoming that difficulty without considerable prodding.

None of the foregoing is to say that Nebraska officials deliberately set out to violate the Compact. Nebraska reduced total groundwater pumping from just over 1,400,000 acre-feet in 2002 to approximately 1,200,000 acre-feet in 2003, then to just over 1,000,000 acre-feet in 2004, and then to approximately 900,000 acre-feet in 2005 and slightly below that in 2006. (N2001 at 25-26 of 168.) Its purchases of surface water for compliance purposes in 2006 (K116 at 3; N4002 at 1-18 of 60; K82; N8004 at 7 of 16), its use of voluntary programs for retiring acreage from irrigation in 2005 and 2006 (Dunnigan Direct at ¶ 28; Tr. at 1304, 1339-40 (Clements); Fanning Direct at ¶¶ 16-17; Tr. at 1036-38 (Fanning); N8003 at 6-7 of 62; N8004 at 6-7 of 16)), and its reduction in allocations for groundwater irrigators (N8003 at 6-7 of 62; Tr. at 981 (Fanning); Tr. at 1303-06 (Clements)) all belie a conclusion that Nebraska sought to violate the

Compact. My conclusion, instead, is that Nebraska hoped to comply, but knowingly failed.

b. 2007 to date

In the wake of Nebraska's admitted breach of the Compact in 2006, both the weather and Nebraska's compliance efforts changed. In 2007, Nebraska finally received precipitation significantly exceeding the average. (K24 at KS780; N8406 at 23 of 68.) Nebraska also significantly restructured its regulation of groundwater pumping.

Nebraska enacted legislation in 2007, LB 701, requiring the adoption of a mechanism for mandatory annual forecasts. (Dunnigan Direct at ¶ 30 (discussing Neb. Rev. Stat. § 46-715).) The forecasting requirement was significant. Heretofore, the provision in the IMPs specifying that an NRD would live within its percentage allocation of the state's Compact allocation was of little actual effect because the state's allocation for each year would not be known until towards the end of the year, and even then not precisely so until the spring of the following year. (*See* FSS app. C. at C48 (setting April 15 reporting requirement for preceding year).)

During 2007, the Department and the NRDs also negotiated and eventually adopted revisions to the IMPs for the five-year period from 2008 to 2012. (Dunnigan Direct at ¶ 21). The key change in this second generation of IMPs was an increase from 5% to 20% in the pumping reduction target (from

pre-FSS years 1998-2002). (Dunnigan Direct at ¶ 21; Tr. at 993-95 (Fanning).) Nebraska also continued to use several federal programs that induced farmers to retire acreage from irrigation. (Dunnigan Direct at ¶ 28; Tr. at 1339-40 (Clements); Fanning Direct at ¶¶ 16-17.) The state had also, at significant expense, removed vegetation from over 150 miles of rivers within the Basin, thereby reducing the amount of water lost within its borders due to non-beneficial consumptive use. (Dunnigan Direct at ¶ 29.)

Despite these forward steps, the second generation IMPs, like the first, still provided no concrete method whereby the state could readily curtail usage to ensure compliance in dry years. In the course of the parties' non-binding arbitration, the arbitrator noted this deficiency. (J7 at JT3247.) Prodded by this criticism, Nebraska adopted a third generation of the IMPs.[35] (Dunnigan Direct at ¶¶ 42-43.)

The central feature of the third generation IMPs is what Nebraska calls a "regulatory back-stop" for dry years, including any potential Water-Short Year Administration. (*Id.*) As noted above, LB 701 required the state to forecast future water supplies in the Basin "whenever necessary to ensure that the state is in compliance with an interstate compact or decree or a formal state contract or agreement. " Neb. Rev.

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[35] A detailed and substantially accurate description of the third generation of IMPs prepared by Nebraska officials is contained in Exhibit N2001 at 53-80 of 168.

Stat. § 46-715(6). In a nutshell, the third generation IMPs provide that for years forecast to be dry, a "regulatory call" will issue from DNR requiring the curtailment of surface water use in the Basin and, to the extent necessary, the curtailment of groundwater pumping altogether within what is called the Rapid Response Region, defined as the region within which the pumping of groundwater has a 10% impact in a two-year period (in other words, where 10% of the volume of water pumped annually will manifest itself as depletion of stream flow within two years). (Tr. at 572-73 (Schneider); Tr. at 1003, 1010-11, 1018 (Fanning); Tr. at 1350 (Dunnigan).) The third generation IMPs are also designed to achieve a pumping reduction of 25% from the baseline pumping from 1998-2002 – an additional 5% over the 20% reduction in the second generation IMPs. (N2001 at 27 of 168; Tr. at 997-99 (Fanning).)

Each NRD is affirmatively required to reduce consumption by the amount of its proportionate responsibility for maintaining Nebraska compliance with the Compact. (Tr. at 1012-14 (Fanning); *see, e.g.*, N5006 at 14 of 26 ("The Board shall consider and adopt any additional actions necessary to meet the District's proportional responsibility for maintaining Nebraska's compliance with the Republican River Compact.").) The NRDs have the choice of several options for meeting this requirement as an alternative to a shutdown of groundwater pumping in the Rapid Response Region – for instance, they may utilize an augmentation pipeline, retire acreage,

and/or order a partial shutdown of pumping in the Rapid Response Region – as long as those actions are sufficient to maintain compliance with the Compact. (Tr. at 1010-14, 1017-18 (Fanning); *see, e.g.*, N5006 at 15 of 26 ("Additional controls and actions may consist of, but are not limited to incentive programs, regulations (inclusive of curtailments of groundwater pumping by wells within the Rapid Response Area), augmentation, management practices, and any other relevant activity.").) But the bottom line is that some action must be taken; if not, under their regulations, the NRDs must shut down pumping in the Rapid Response Region. (Tr. at 1013-14 (Fanning); *see, e.g.*, N5006 at 15 of 26 ("For the wells within the Rapid Response Area the allocation during a Compact Call Year shall be set at the maximum allowable that would not cause the District's depletions to stream flow to exceed the District's allowable groundwater depletions after taking into consideration other actions and controls that the District would implement.").)[36] If the NRDs refuse to take that step, the DNR retains th[illegible] authority to shut down pumping in

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[36] Kansas spent much time and effort trying to establish the proposition that the third generation of IMPs did not place on the NRDs a requirement to take any action at all, and that the NRDs have absolute discretion to take, or not take, action in a Compact Call year. I find that the third generation IMPs unambiguously contradict this proposition. The regulations implementing the IMPs state that the NRDs "shall" take the necessary action to maintain Compact compliance, and discretion is only granted as to the manner in which compliance is achieved. (*See* N5006 at 14-15 of 26.)

the Rapid Response Region. (Tr. at 1015-16, 1038-39 (Fanning); Tr. at 1389-92 (Dunnigan).)

As the weather pattern relieved the dry conditions (Barfield Direct at 33; K54 at 2-3), these cumulative steps have proved to be more than adequate. During the most recent five-year period for which data has been compiled by the RRCA (2007-2011), Nebraska used less than its Compact allocation by an average of 63,685 acre-feet per year, for a total of 318,426 acre-feet, and Nebraska's groundwater pumping dropped while groundwater pumping in Kansas and Colorado did not drop. (N2001 at 11 of 168; Schneider Direct re Future Compliance at ¶ 13; Dunnigan Direct at ¶ 33.) Nebraska might also observe that from 2008 to 2011, its groundwater pumping per acre dropped even as precipitation trended downward somewhat, although the margins are not large enough to carry much weight. (K54 at 3, Figure 1.)

c. Looking forward

On the whole, the record of the past five years makes clear that Nebraska now, somewhat belatedly, has in place what it needs to comply with the Compact easily in relatively wet years, and to do so by amounts that create a substantial accrued credit in the five-year running average calculations. What Kansas is really concerned about, though, is how Nebraska will fare in future dry years absent issuance

of the type of injunctive relief and punitive sanctions Kansas requests.

To test the adequacy of the current IMPs for an extended run of dry years, Nebraska's expert, Dr. James Schneider [37] has run the RRCA Groundwater Model for the years 2002-2006 with all groundwater pumping shut off in the Rapid Response Region. (N2001 at 34-36 of 168.) In other words, he has effectively run the model to see how the actual experience in those dry years would have been different had the groundwater reduction tool now in the IMPs been implemented. The results of this model run show that Nebraska would have lived within its Compact allocation in each of those five years by an average of 7,000 acre-feet per year. (N2001 at 35 of 168; Schneider Direct re Future Compliance at ¶¶ 31-33; Tr. at 641-42 (Schneider).) This model run assumed no changes in surface water use from the actual surface water use in 2002-2006. (N2001 at 35 of 168.) Thus, there was room for a further cushion if need be. Further, this model run assumed that there would be no change in the RRCA Accounting Procedures, and that Nebraska would bear partial responsibility for the evaporation from Harlan County Lake in 2006. (N2001 at 34 of 168 n.29.) For the reasons

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[37] Schneider holds a Ph.D. in Geology and has expertise in groundwater flow modeling, hydrology, and hydrogeology. (Schneider Direct re Future Compliance at ¶ 4.) He has extensive experience in water resources management, including as Deputy Director of the DNR. (*Id.* at ¶¶ 3, 5.)

discussed in Sections VI.A and B of this Report, actual accounting in any future dry period would allocate Harlan County Lake evaporation differently and would include a change in the Accounting Procedures eliminating the current treatment of some imported water consumption as the consumption of virgin water supply by Nebraska against its allocation. Additionally, the conditions in 2002 through 2006 were difficult years in which to comply with the Compact, as five of the six lowest Compact allocations in the history of the Basin occurred in those years. (Schneider Direct re Future Compliance at ¶ 32.) For all of these reasons, the case is compelling that the current IMPs will be effective to maintain compliance even in extraordinarily dry years.

Kansas offers no credible technical critique of the results of Schneider's retrospective modeling aimed at determining what would have happened in 2002-2006 had the current IMPs been in effect and actually employed to curtail consumption. Instead, Kansas contends that the amount of groundwater pumping that will be allowed in Nebraska in normal and wet years over the course of decades will accumulate what will essentially become a permanent depletion of possible groundwater feeds into stream flow that will eventually make compliance with the Compact impossible in dry years. Second, Kansas contends that the IMPs are not enforceable and therefore there is no assurance that water users will actually comply with them in any meaningful manner. For the following

reasons, the evidence falls short of adequately proving either of these contentions.

(i) Kansas' projection of Nebraska's current practices over the course of coming decades falls short of the mark and rests on invalid assumptions.

To supports its argument that the IMPs, even if enforced, will prove insufficient over the long run, Kansas has employed the RRCA Groundwater Model in an effort to model the future effects of Nebraska's current practices and compliance tools. (K24; K54.) Nebraska, in turn, marshals an array of criticisms regarding the manner in which Kansas employs the model to project future conditions and the assumptions that Kansas has employed in making those projections. A careful study of the complex and competing expert presentations leads to the following observations.

First, Kansas' projections provide no support for any contention that Nebraska lacks the tools necessary to ensure compliance in the next decade or so. Indeed, the projections posit no material increase in annual stream flow depletions by groundwater pumping over the next ten years. (K24 at KS741-48 & Figures 4-9). Nor does Kansas claim to have predicted any likely future date of noncompliance: Kansas' witnesses expressly admitted that they could not do so. (Tr. at 299, 328-29, 372-73 (Larson); Tr. at 450

(Barfield); Tr. at 848 (Pope).) Instead, the purpose of the projections is to establish that, over the very long run, base flows within the Basin's hydrological system will gradually trend downward, eventually resulting in a long-term inability to comply with the Compact in dry periods even if no surface water at all is consumed. (K24 at KS722.) The span of time covered by Kansas' projection is roughly 60 years. (Larson Direct at 13.) Significantly, Kansas' experts provide no assessment of the percentage likelihood that a Compact violation will occur within any ranges prior to the end of that period.

Second, the projections are built on several incorrect technical assumptions. They contain no adjustment for eliminating the charge to Nebraska for consumption of imported water supply. And they fail to analyze the effect of any additional management actions by Nebraska, such as surface water controls and augmentation projects. (N2001 at 28-29, 31-32 of 168; Tr. at 304-05 (Larson); Tr. at 455-59 (Barfield).) Accordingly, they fail to accurately capture the technical impact of the third generation IMPs.

Third, Kansas' use of the Groundwater Model to project future conditions assumes that the future will largely replicate the past. (N2001 at 22-23 of 168.) To project what would have happened in a recent prior year had one factor or several factors been different is relatively easy because, by definition, all of the other factors would have remained constant. To project the results of current behavior far into the distant future is more problematic because there is no reason to

assume that all other factors will remain constant. Rather, considered experience and common sense suggest that, over the long term, it is virtually certain that many other factors will not remain constant. If one goes back in time by roughly the 60 years that Kansas' projection goes forward in time, one finds that much has changed in the Basin. In 1950, for example, there were no soybeans, wheat or hay harvested in the Nebraska Republican River Basin counties. (N2001 at 82 of 168.) By 2002, substantial volumes of all three were grown. (*Id.* at 83 of 168.) Tillage practices, which affect retention of soil moisture (Tr. at 121 (Ross); Tr. at 1105 (Brzon)), have changed markedly since 1969 (N2001 at 86 of 168), as have planting, fertilizing, and harvesting practices (N2001 at 89 of 168). More recently, GPS technology has been adopted to track and plan farming procedures. (*Id.*) And there was much testimony at trial about how basic irrigation technology itself has changed, substantially affecting water conservation and return flows. (*See, e.g.*, Tr. at 85-88 (Ross); Tr. at 1105-06 (Brzon).)

It is true that most changes over time have resulted in or coincided with increased levels of consumption. It does not follow, however, that future change from the static state assumed by Kansas will not result in lower levels of consumption, or greater sources of alternative supply. Especially significant is the fact that Nebraska's current plans call for it to evaluate and potentially reconsider its third generation IMPs in the year 2015. (N2001 at 28 of 168.) This

means that the basic assumption underlying Kansas' projections – that the current IMPs will remain unchanged for 60 years – is unsupported, and very likely wrong. Nor is it unlikely that the Basin will experience projects or purchases augmenting the virgin water supply. (Tr. at 1325-27 (Clements).) And it is fair to assume that if Kansas' projection of future results from current conditions appears to bear out in the coming years, the likelihood that Nebraska will adopt such changes will increase.[38]

(ii) Kansas fails to establish that the IMPs are unenforceable.

Kansas argues, second, that even if the IMPs are technically up to the task of ensuring compliance going forward, they are simply not enforceable and will therefore not be adequate in requiring the NRDs and others to make the sacrifices that will be necessary in order to achieve Compact compliance. Kansas contends that the IMPs are "[v]ague" (Kansas' Post-Trial Brief (Corrected) at 55, *Kansas v. Nebraska*, No. 126 Orig. (Sept. 25, 2012) (Dkt. No. 385)), that "there could be disputes between the DNR and the NRDs on how to proceed with enforcement through the use of various controls outlined in the IMP" (*id.* at 59), and

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[38] Such action by Nebraska would seem to be made even more likely by the exposure it would face for future Compact violations as suggested in Section VI.F.7 of this Report.

that it is not clear that the DNR would be able to enforce the IMPs in the event of a dispute with the NRDs (*id.* at 60). The scenario thus posed by Kansas is that Nebraska's DNR determines that a curtailment of a district groundwater pumping is necessary in order to achieve Compact compliance, a district then refuses to comply with the DNR's determination, and the DNR is subsequently unable to secure the reversal of that refusal within sufficient time to allow the curtailment to work.

This entire argument is based on considerable conjecture. Kansas cites no instance in the past when the DNR told an NRD to take some specific action necessary to secure compliance, the NRD refused, and the DNR was unable to secure compliance with its directive. The only NRD representatives who testified in this action disavowed any intent or inclination to refuse direction from the DNR in such matters. (*See*, *e.g.*, Tr. at 1318, 1322 (Clements).) To the contrary, they made clear that they viewed themselves "absolutely" bound by DNR determinations in such matters under the third generation IMPs. (Tr. at 1335 (Clements); *see also* Tr. at 1014 (Fanning).)

Kansas is correct that Nebraska's statutory law is complex, and contains no express statement that the DNR may order groundwater pumping curtailments. The IMPs, however, are statutorily-mandated, *see* Neb. Rev. Stat. § 46-715, and contain express agreements between the DNR and the NRDs. Nebraska's Attorney General asserts, without qualification, that the "DNR, by and through the Office of the

Attorney General, holds legal authority to bring such proceedings as necessary to ensure compliance with the IMPs, including shutting down wells as necessary." (Nebraska's Post-Trial Brief at 30, *Kansas v. Nebraska*, No. 126 Orig. (Sept. 24, 2012) (Dkt. No. 383) (citing Neb. Rev. Stat. § 84-207).) Further, representatives of both the DNR and the NRDs testified that the DNR had the authority to enforce a curtailment of groundwater pumping in the Rapid Response Region. (Tr. at 1015-16 (Fanning); Tr. at 1391-92 (Dunnigan).) Even Kansas concedes that, at the least, the DNR could bring a dispute with an NRD before the Nebraska Inter-related Water Review Board under Neb. Rev. Stat. § 46-719. (Kansas' Post-Trial Reply Brief at 33, *Kansas v. Nebraska*, No. 126 Orig. (Oct. 15, 2012) (Dkt. No. 390).) Kansas posits that maybe the Inter-related Water Review Board would rule against the DNR, but such an argument could be made against any enforcement scheme. In sum, Kansas has not carried its burden of establishing that the NRDs would likely successfully block a DNR determination that groundwater pumping curtailment is required to achieve compliance.

In an alternative argument, Kansas questions whether the surface water curtailment called for under the third generation IMPs is lawful. Under the third generation IMPs, the first action Nebraska would likely take during a year in which an exceedance is feared would be to issue an order on January 1 precluding all diversions of surface water until further order, thus eliminating surface water

CBCU in Nebraska. (Tr. at 1350 (Dunnigan).) In Nebraska's view, the water could then be stored temporarily in Harlan County Lake for use in KBID. (Tr. at 1351-52 (Dunnigan).) However, the possibility also exists that the water could not be stored in Harlan County Lake; in such an event, the water would flow downriver, where it could be diverted by Kansas through the Courtland Canal for use in irrigation, or for storage in the Lovewell Reservoir. Should Lovewell be full, then such water flowing downriver outside of the irrigation season would flow out of Nebraska, but be of little practical benefit to Kansas. (Tr. at 1352-56, 1359-60 (Dunnigan).)

Kansas asserts that this proposed course of action would violate federal law, and that the federal government need not cooperate with Kansas to agree to a temporary storage arrangement in lieu of the current arrangement. Kansas argues, as well, that any action by Nebraska that causes water to be delivered when Kansas can neither use nor store it would violate the Compact.

The simple answer to these arguments is to note that Schneider's modeling demonstrated that curtailment of groundwater pumping in the Rapid Response Region by itself would have been sufficient to have achieved compliance in the 2002-2006 dry period. (N2001 at 34-36 of 168.) Hence, even were Kansas' anticipatory challenge to the proposed surface water curtailments valid, it would prove too little.

Second, it is not even clear to me now exactly how Kansas claims that a surface water curtailment ordered by DNR would necessarily violate federal law. Kansas only belatedly and indirectly raised this facial legal challenge to the IMPs (as evidenced, perhaps, by the complete lack of any briefing on this issue by the United States). Moreover, the legal challenge assumes behavior by federal officials that is not intuitively obvious. Without a surface water curtailment order, water flows into Harlan County Lake, and is then released as needed for irrigation downstream by KBID or NBID as they request. As envisioned under the IMPs, that unrestricted diversion would be replaced by a diversion pursuant to an agreement with Kansas to divert and store water that Kansas would then take that year. Kansas offers no evidence compelling the conclusion that such an agreement would not be reached.

Third, Kansas points to no provision in the Compact requiring Nebraska to make available to Kansas water only when and where Kansas needs it. Rather, the Compact mostly allocates the water supply in the Basin for beneficial consumptive use, thereby constraining consumption. *See* Compact art. IV. Kansas does have the right to take a major portion of its allocation at Guide Rock, *see id.*,[39] but

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[39] Article IV provides that Kansas has the right to 138,000 acre-feet "[f]rom the main stem of the Republican River upstream from the lowest crossing of the river at the Nebraska-Kansas state line and from water supplies of upstream basins

(Continued on following page)

Nebraska is not obligated always to deliver all of Kansas' Compact allocation at Guide Rock. (*See* Second Report at 55-59.) The FSS simply "secure[d] for Kansas greater access at Guide Rock to the water allocated to Kansas" consistent with Nebraska law. (*Id.* at 59.) There is certainly no absolute requirement that all water be delivered to Guide Rock during a particular irrigation season. And Kansas makes no showing that the current IMPs would preclude Kansas from taking its requisite allocation at Guide Rock.

2. The Court Should Accept the States' Agreement that Nebraska Should Pay for Its Breach With Money Rather than Water.

The foregoing discussion in Section VI.F.1 of this Report informs evaluation of both the measure of damages, discussed next in Section VI.F.3, and the availability of injunctive relief, discussed in Section VI.F.7. First, though, it is necessary to address the form of a remedial award.

The Compact specifies no particular form of remedy. It simply allocates to each state an agreed-upon share of the subject waters. In this respect, it is

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otherwise unallocated," and that Kansas has the right to "divert all or any portion" of that 138,000 acre-feet "at or near" Guide Rock, Nebraska. Compact art. IV. This 138,000 acre-feet is a substantial portion of Kansas' average total allocation of 190,300 acre-feet. *Id.*

a typical compact for the apportionment of interstate waters. *See, e.g.*, Pecos River Compact of 1949, ch. 184, 63 Stat. 159. Prior to 1987, one might therefore have presumed that the remedy for the past breach of such a compact would be limited to a form of specific performance; *i.e.*, an award of water. Report of the Special Master at 31-32, *Texas v. New Mexico*, No. 65 Orig. (July 29, 1986). *See also Kansas v. Colorado*, 533 U.S. 1, 23 (O'Connor, J., concurring in part and dissenting in part) ("[U]ntil 1987, we had never even suggested that monetary damages could be recovered from a state as a remedy for its violation of an interstate compact apportioning the flow of an interstate stream.").

Ordering a remedy in the form of water would have several advantages. It would eliminate the need to convert water to money, a problematic and uncertain undertaking that I discuss below. It would also finesse the otherwise nettlesome task of choosing between disgorgement and compensation in a case such as this where the economic value of using extra water in Nebraska exceeds the economic value realized downstream by Kansas when Nebraska does not use that water. All else being equal, an order that Nebraska reduce its future use in a comparable year by the amount of its past excess might both disgorge the fruits of Nebraska's breach while simultaneously restoring to Kansas only the loss caused by that breach.

In *Texas v. New Mexico*, however, the Court made clear that it was free to order "a suitable remedy,

whether in water or money." 482 U.S. 124, 130 (1987). The Court also suggested that the breaching state might be allowed to elect a monetary form of remedy. *Id.* at 132.

The question whether to allow such an election is simplified here because all three states agree that the remedy should be in dollars, not water.[40] Likely all of them fear the unintended and collateral effects of any attempt to specify in an order the details of a remedial allocation. The most problematic detail would concern the timing of any remedial reduction in the upstream allocation. A gallon delivered during irrigation season in a water-short year when clear skies persist and crop prices are high is hardly the same as a gallon delivered in the fall of an ideal year with bumper crops. Location matters, too. A gallon not used well above Guide Rock is worth more to Kansas than a gallon not used below Guide Rock because it can be regulated through Harlan County Lake and diverted through the Courtland Canal. And given that Nebraska breached the Compact because its average use over two years exceeded its average allocation, should Nebraska retain discretion over whether and to what extent any remedial reduction should occur in one year or be spread over several years? The basic point is that, notwithstanding its several advantages, the use of water as the remedial currency poses challenges of its own. Accordingly, I

[40] No state suggests that Section V.B.2.f. of the FSS is applicable to the facts of this breach.

see no reason for the Court to reject the states' joint election that any award be in the form of money rather than water.

3. The Measure of Damages May Take into Account Both Kansas' Loss and Nebraska's Gain.

In a run-of-the-mill breach of contract action between private parties, the customary measure of recovery is the reasonably foreseeable loss caused by the breach. *See* Restatement (Second) of Contracts § 347. Even for some breach of contract actions, however, disgorgement of the breaching party's gain might be an alternative measure of recovery in the event of a "deliberate" breach where the normal damage remedy "affords inadequate protection to the promisee's contractual entitlement." Restatement (Third) of Restitution and Unjust Enrichment § 39 (2011). Kansas argues that this is such a case.

As the preceding discussion of Nebraska's compliance efforts spells out, Kansas is correct that Nebraska knowingly exposed Kansas to a substantial risk that Nebraska's compliance measures would not ensure compliance if the weather did not cooperate. Possessing the privilege of being upstream, Nebraska paid more attention to its internal concerns than to its obligations to the downstream state. At the same time, though, there is no evidence that Nebraska deliberately opted for noncompliance in 2006. Its efforts in 2006 to reduce the scope of its ensuing

noncompliance – albeit too late and too little – were earnest and substantial enough to preclude a finding that this was a consciously opportunistic breach. Accordingly, were this an ordinary breach of contract case, Kansas' reasonably foreseeable loss would provide the measure of damages.

This is not, however, a run-of-the-mill breach of contract case adjudicated at law in an action between two private parties. In several important respects, the oft-stated notion that a compact is a contract, while certainly true, *see Petty v. Tennessee-Missouri Bridge Comm'n*, 359 U.S. 275, 285 (1959), is an incomplete description that overlooks important characteristics of such an agreement. The Compact represents an attempt to delineate consensually two sovereigns' rights to water. Each state's right to the water pre-existed the Compact, and might well have been delineated by a court order equitably apportioning the water of the Basin. *See, e.g., Nebraska v. Wyoming*, 325 U.S. 589 (1945). Those rights are in some respects similar to rights in real property. *See* 93 C.J.S. *Waters* § 2 (water rights are "real property"); 78 Am. Jur. 2d *Waters* § 5 ("A water right is a property right, and is considered real property."). *See also Federal Power Comm'n v. Niagara Mohawk Power Corp.*, 347 U.S. 239, 252 (1954) ("Riparian water rights, like other real property rights, are determined by state law."). Actions involving the taking of real property, in turn, routinely apply disgorgement as the measure of damages. *See* Restatement (Third) of

Restitution and Unjust Enrichment § 40. Here, one might fairly say that Nebraska took Kansas' water.

The Court has also observed that the Compact is a law of the United States. *See Texas v. New Mexico*, 462 U.S. 554, 564 (1983). Actions arising out of a breach of statutory law often employ measures of damages aimed at divesting the wrongdoer of any gains derived from the statutory violation. *See Porter v. Warner Holding Co.*, 328 U.S. 395, 400 (1946) (observing that courts' "inherent equitable jurisdiction" under the Emergency Price Control Act "clearly authorizes a court in its discretion, to decree restitution of excessive charges in order to give effect to the policy of Congress"). *See, e.g., SEC v. Patel*, 61 F.3d 137, 139 (2d Cir. 1995) ("In the exercise of its equity powers, a district court may order the disgorgement of profits acquired through securities fraud" under the Securities Act of 1933 and Securities Exchange Act of 1934); *Commodity Futures Trading Comm'n v. American Metals Exchange Corp.*, 991 F.2d 71, 76 (3d Cir. 1993) (courts have the authority to order disgorgement "for the purpose of depriving the wrongdoer of his ill-gotten gains" under the Commodity Exchange Act (internal quotation marks omitted)). These considerations suggest that disgorgement may be a proper remedy.

A factor that cuts the other way is the general and national public interest in the efficient use of our country's waters. One might argue that if water is much more valuable when used in the upstream state, then why not lean towards a measure of

damages predicated on a recognition of the notion of efficient breach of contract? *See generally* 3 E. Allen Farnsworth, Farnsworth on Contracts §§ 12.3 at 157-58, 12.20 at 329-30 (3d ed.) (discussing the concept of efficient breach and the effect of disgorgement on efficient breach). While the benefits of efficiency reinforce the customary reluctance to employ disgorgement as the measure of an award in the typical action for breach of contract, they carry less weight in the context of a contract of this type, where interests of sovereignty, property, and compliance with the law are also at stake. Further, too, an assessment that a river might be pumped dry as long as the downstream state is compensated for the short-term impact on its gross state product pays too little heed to the public interest in the flow of a major river. Few people in Kansas, for example, would agree to a return to the dust bowl in exchange for relocation to an economically equivalent residence and livelihood elsewhere. Moreover, to the extent that there is a benefit to allowing a role for economic efficiency, it remains open for the states to negotiate and share the efficiency.

The Court itself has never addressed the question of the proper measure of damages in a case for breach of a compact apportioning water rights. The Court's guidance on the form of remedy, however, provides some insight into the measure of the remedy. As noted above, the remedy may be in the form of money or water. A payment in comparable water (*i.e.*, water delivered under river basin conditions similar

to those extant when the water was improperly taken) is both a make-whole remedy and (as to the payor) an effective disgorgement. In *Texas v. New Mexico*, the Court charged the special master with deciding on the form of remedy based on an equitable consideration of what is suitable under all the circumstances of the case. 482 U.S. 124, 131-32 (1987). While simultaneously suggesting that a decision to award sanctions also might hinge on a finding that the breach was deliberate, *id.* at 132, the Court suggested no such single test for deciding whether to order that the remedy be in the form of water.

This is not to say that I read *Texas v. New Mexico* as implying acceptance of the use of disgorgement. To the contrary, the question of the measure of damages was not presented. Further, the Court made clear that one reason for not ordering payment in water in a particular case might be that, as can be the case with orders of specific performance, "some attention to the relative benefits and burdens that the parties may enjoy or suffer" need be given. *Id.* at 131. This equitable principle cautions against the automatic use of a remedy that unnecessarily burdens the defendant. I therefore read the opinion only as confirming the notion that, in actions of this type, the Court's equitable discretion is flexible in fashioning remedies to further the interests at stake in these cases.

I have also reviewed the special master's Second Report in *Kansas v. Colorado*, No. 105 Orig. Nebraska correctly notes that the report rejected a request (by

Kansas, no less) for disgorgement, and opted instead for a classic expectancy measure of loss. In so doing, however, the Special Master made clear that his recommendation was the product of the exercise of a very broad equitable discretion that "perhaps" allows "looking to upstream gain under appropriate circumstances." Special Master's Second Report at 82, *Kansas v. Colorado*, No. 105 Orig. (Sept. 9, 1997). Like me, he viewed his charge as providing for a measure of damages that achieved a "fair and equitable solution." *Id.* at 84. And his description of the circumstances of the parties' respective conduct in that case suggests that discretion favored the measure upon which he settled.

In keeping with this discretion, I conclude that the Court need not make an either-or selection between the measures of loss and gain. The Court sits in this action to provide a forum within which what were heretofore causes of war can be resolved between our sovereign states in our federal system. *See North Dakota v. Minnesota*, 263 U.S. 365, 372-73 (1923); *Kansas v. Colorado*, 185 U.S. 125, 140-44 (1902). The aim is to find a remedy that is "fair and equitable" and "that is consistent with the Compact terms." *Texas v. New Mexico*, 482 U.S. 124, 134 (1987). Viewed from this perspective, it makes more sense for the Court to look at loss and gain as end points on a spectrum of damages, and then to calibrate the selection of a fair point on that spectrum in a manner that recognizes the numerous interests I

have discussed above, plus the difficulty in such actions of determining precisely either loss or gain.

4. Kansas' Loss

The evidence is indisputable that Kansas suffered a loss by virtue of Nebraska's consumption of very large volumes of water in excess of its Compact allocations for 2005 and 2006. The parties dispute, instead, the amount of that loss. In so doing, they take two very different approaches. Kansas seeks to estimate the size of the reduction in its harvest and the resulting diminution in gross state product.[41] Nebraska criticizes the Kansas analysis, and offers instead an attempt to place a value on the lost water itself based on sale and lease transactions of irrigated land, and some transactions for the sale and lease of water.[42]

Although advocating different approaches, and challenging the adequacy of each other's proof, Kansas and Nebraska do not materially dispute the principles of law that guide an assessment of damages. Kansas must prove damage by a preponderance of the evidence. *See Addington v. Texas*, 441 U.S. 418, 423 (1979) (the "typical civil case" requires proof by a preponderance of the evidence); 23 Williston on

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[41] A summary of Kansas' damages analysis is attached hereto as Appendix I.

[42] A summary of the transaction evidence is attached hereto as Appendix J.

Contracts § 63:14 ("The plaintiff has the burden of proof on all of its breach of contract claims."). Where the fact of damage is reasonably certain, but the amount inescapably uncertain, "[t]he law will make the best appraisal that it can, summoning to its service whatever aids it can command." *Sinclair Refining Co. v. Jenkins Petroleum Process Co.*, 289 U.S. 689, 697 (1933). While "damages may not be determined by mere speculation or guess, it will be enough if the evidence show the extent of the damages as a matter of just and reasonable inference, although the result be only approximate." *Story Parchment Co. v. Paterson Parchment Paper Co.*, 282 U.S. 555, 563 (1931).[43] *See J. Truett Payne Co. v. Chrysler Motors Corp.*, 451 U.S. 557, 565-66 (1981) (noting that, where "[t]he vagaries of the marketplace deny us sure knowledge of what plaintiff's situation would have been in absence of" the violation, the court is willing to accept a "just and reasonable inference" of damage); *Palmer v. Conn. Ry & Lighting Co.*, 311 U.S. 544, 559 (1941) ("All that can be done is to place before the court such facts and circumstances as are available to enable an estimate to be made based upon judgment and not guesswork."); *Eastman Kodak Co. v. S. Photo Materials, Inc.*, 273 U.S. 359,

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[43] *See also* 25 C.J.S. *Damages* § 37 ("What is required is that evidence of such certainty as the nature of the particular case permits should be produced."); 22 Am. Jur. 2d *Damages* § 328 ("When damages are difficult to prove, the plaintiff is required to prove them with the precision that the facts permit but no more.").

379 (1927) ("Damages are not rendered uncertain because they cannot be calculated with absolute exactness. It is sufficient if a reasonable basis of computation is afforded, although the result be only approximate.").

Guided by these principles, the next two subsections of this Report analyze, in turn, the states' competing damage presentations. In so doing, it concludes that the amount of Kansas' loss is quite uncertain, and likely unknowable, but that $3,700,000 is a fair estimate.

a. Analysis of Kansas' attempt to estimate its loss of gross state revenue suffered by farmers and their vendors

Kansas' expert, Professor Joel R. Hamilton, testified that payments (in 2012 dollars) in the amounts of $2,595,381 for 2005 and $2,531,611 for 2006 (for a total of $5,126,992) would compensate Kansas for the value added[44] that was lost by Kansas farmers and their vendors as a result of Nebraska's failure to satisfy the two-year running average compliance test for 2006. (Hamilton Direct at 50; K105 at

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[44] "Value added," a term Kansas' experts use interchangeably with "income,' is the "difference between what a producer receives from the sale of output and the cost of produced inputs." (K105 at KS557-58.) All value added in a state equals that state's gross state product.

KS566, 611.) This conclusion rests on Kansas' stacked array of expert opinions. First, Dale Book calculates the amount of additional water that would have been available to and used by Kansas farmers in 2005 and 2006 but for Nebraska's breach, which he refers to as the "required water." (K5.) Second, Klocke estimates the differential impact on crop yields that the required water would have had. (K99.) Third, Hamilton and Robison estimate the resulting increase in the value of the harvest, and the resulting increases in value added to the Kansas economy that would have been realized by Kansas farmers and their direct and indirect vendors. (K105.)

These expert analyses are quite complex and contain many interim, technical steps. Even an outline summary of all the steps is too detailed for the text of this Report. What I have done, instead, is to attach as Appendix I an outline that walks the reader in summary fashion through the analysis as set forth in the three interlocking expert reports, which themselves total 140 pages. The full expert reports are contained in Exhibits K5, K99, and K105.

Central to Kansas' expert analysis are: the assumed starting point (*i.e.*, the amount of water by which Nebraska exceeded its allocation); the extent to which one can assume that the so-called required water would have been available during irrigation season when it would have been useful; the amount of precipitation in KBID that would have affected the amount of irrigation farms required and the impact of marginal increases in water on yields; the actual

determination of the impact on yields; and the manner in which cross-border transactions between Kansas and Nebraska farmers and vendors need be accounted for.

Nebraska challenges Kansas' analysis on each of these points as well as sundry other, less overarching points. My evaluation of those challenges is as follows:

(i) Kansas' experts incorrectly assume that Nebraska used more water in 2006 than it actually used.

Kansas expert Dale Book,[45] a civil engineer, begins the Kansas damage presentation with an assumption that Nebraska exceeded its Compact allocation by 42,860 acre-feet in 2005 and by 36,100 acre-feet in 2006. (Book Direct at 12; K5 at 1, 12.) Nebraska agrees that 42,860 acre-feet is the correct amount of its 2005 exceedance. (*See* Stipulation of Overuse.) Nebraska correctly points out, however, that Book's assumed amount of Nebraska's overconsumption for 2006 includes an allocation to Nebraska of one-half of the Harlan County Lake evaporation for 2006. (Book Direct at 12.) As I discuss in

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[45] Dale Book is a consulting civil engineer who specializes in hydrology, water resources, and water rights engineering. (Book Direct at 3.) Book previously testified as an expert in *Kansas v. Colorado*, No. 105 Orig. (Book Direct at 5.)

section VI.B of this Report, that evaporation is properly charged to Kansas, not Nebraska. Therefore, the amount of Nebraska's over-consumption for 2006 is 28,009 acre-feet.

If the relationship between Nebraska's over-consumption and Kansas' loss were uniformly proportionate, then this error in Kansas' loss analysis would simply require a reduction of approximately 22%[46] in the 2006 loss calculation. The evidence, however, is that the relationship between marginal amounts of additional water and crop yields in the relevant range at issue here is of diminishing slope, such that each incremental addition of water produces less additional yield than the prior incremental amounts (once one has reached a minimum amount). (Tr. at 1649-53 (Sunding); Tr. at 1703-04 (Klocke).) Book himself acknowledged that any change to his 2006 assumptions would result in a non-linear effect. (Tr. at 241-42 (Book).) To the extent this is so, an adjustment in Kansas' loss calculation for 2006 by 22% errs, if at all, in favor of Nebraska. Were I not otherwise giving Kansas the benefit of the doubt on sundry minor points raised by Nebraska concerning the 2006 damage calculation, I would likely have given Kansas' expert an opportunity to calculate this amount more precisely and thus recalculate the loss figure for 2006.

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[46] 8,091 (the amount of evaporation to be subtracted from Kansas' estimate of Nebraska's overuse) divided by 36,100 (Kansas' estimate of Nebraska's overuse).

(ii) Kansas' experts reasonably conclude that the additional water Kansas would have received but for Nebraska's breach would have been available during the irrigation seasons.

Using the assumed amount of water that Nebraska overused, Book sought to calculate the amount of water that would have been delivered to the Kansas farms had Nebraska not violated the Compact (*i.e.*, what he calls the "required water"). Water that is delivered when it can be used or stored for irrigation is valuable. Water flowing down the canal outside of irrigation season is generally of little value, except to the extent it might be stored in a less-than-full reservoir for later irrigation needs. In conducting this analysis, Book assumed that all of the required water would have been delivered to Kansas during the irrigation seasons and therefore would have been available for irrigation. (Book Direct at 14; K5 at 3; Tr. at 178 (Book).)

According to Book, his assumption that the required water would be delivered during the irrigation seasons was based on "the location of the point of compliance," namely, "Guide Rock, which is the control point on the river where the [Kansas] Bostwick Irrigation District takes their water; [KBID gets its] water at that point either by releases from Harlan County Reservoir or by picking up water in the river at other times and then transporting that to

Lovewell Reservoir, which is a reservoir within the Project area that provides storage." (Tr. at 178 (Book).) According to Book, "it's the combination of the location of the compliance point with the storage that supports that assumption." (Tr. at 178 (Book).) Book acknowledged that "[i]f you assume that some of the overuse in Nebraska flowed past the dam at Guide Rock, then it would not be available for KBID." (Tr. at 179 (Book).)

Book assumed that the irrigation season lasted from May to September. (Tr. at 179 (Book).) The record better supports the conclusion that, historically, the irrigation season lasts from mid-June through August, terminating around September 1. (Tr. at 70 (Ross); Tr. at 1065 (Nelson).)

Nevertheless, Book testified that, even if the irrigation season were shorter than he had posited, it would still be proper to assume that the required water would be available during the irrigation season. (Tr. at 181 (Book).) According to Book, he only used his irrigation season assumption "to generate a timing of the return flows" (Tr. at 179 (Book)), *i.e.*, irrigation run-off that makes its way back to the river. Book took the position that "the irrigation season doesn't really matter," other than for calculation of return flows, "because of the existence of the storage. So the basic assumption is that the water would have been delivered during the irrigation season." (Tr. at 179 (Book).)

Nebraska challenges this assumption. Its expert, Thomas Riley,[47] opined that "Nebraska's overuse of its allocation in 2005 and 2006 would not equate to water available in [Harlan County Reservoir] to be routed to KBID because much of that water would arrive outside the irrigation season." (N6003 at 77 of 88.) Riley reached this conclusion because of an apparent conflict between Book's required water analysis and Book's separate analysis of what measures would have been required for Nebraska to achieve Water-Short Year Administration compliance in 2006 (*see* K12), as well as testimony by other Kansas experts (Perkins and Larson) analyzing pumping reduction impacts for 2005 and 2006 (*see* K19). (N6003 at 77-78 of 88). Riley contends that these two reports are inconsistent with Book's analysis of the required water, and therefore disprove the idea that the required water would be available during the irrigation season, because these reports show that over 19,000 acre-feet of water would not have been available to route through Harlan County Lake during the irrigation season. (*Id.*; *see* Tr. at 953 (Riley).) According to Riley, "It follows, that since not all of the water would have been available to Kansas in the irrigation season, the Return Flow timing and amounts presented" by Book in his required water analysis "are overstated." (N6003 at 78 of 88.)

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[47] Thomas Riley is a water resources and environmental engineer with extensive experience in the field and a Master's in Civil Engineering. (Riley Direct at ¶¶ 3-4.)

Riley made two concessions at trial regarding this criticism. First, he acknowledged that the water that became available too late in 2005 to affect that year's irrigation season could have been stored and potentially used in 2006. (Tr. at 953-54 (Riley).) Second, he acknowledged that, if Nebraska front-loaded its compliance efforts, those efforts would make it more likely that the water would be available during the irrigation season. (Tr. at 954-55 (Riley).) He did qualify this latter concession by stating that "[i]t may not have all been available. You still could have had some of it outside the irrigation season and primarily from the well pumping and in this change that occurs in return flows." (Tr. at 955 (Riley).) According to Riley, questions remain as to "whether it would have been called for and used and how much would have been available depending on how you examine how compliance could be conducted," that is, depending on how much front-loading there was. (Tr. at 956 (Riley).) If compliance took place more evenly throughout the year, then some of it would have become available after the irrigation season. (Tr. at 956 (Riley).) Further, while Riley found it unlikely that Nebraska's compliance efforts would have entirely taken place in 2006 (as opposed to taking place in both 2005 and 2006) if Nebraska had complied with the Compact, he nevertheless agreed that if Nebraska had tried to make up the entirety of its overuse in 2006 then it is likely that enough of that water would have been delivered during the irrigation season to meet Book's assumed delivery of required water. (Tr. at 963-64 (Riley).)

Riley's critique is undercut not only by his own concessions, but also by the testimony of Schneider, Nebraska's Deputy Director of its DNR. When asked whether Nebraska's "approach would be, if anything, to front-end load [compliance measures] at the beginning of the year and then evaluate after you get into the year whether you might lighten up on the curtailment" (Tr. at 639 (Special Master)), Schneider responded: "That's exactly what I intended to say and that's exactly how it's designed to work and will work" (Tr. at 639 (Schneider)). In response to the follow-up question, "[a]nd is part of the purpose of that to put you in a position so that that water could be shepherded to Kansas during their irrigation season at a time when it would be beneficial?" (Tr. at 639 (Special Master)), Schneider answered, "[y]es" (Tr. at 639 (Schneider)).

Based on this record, it appears that the best conclusion is that substantially all of the required water would likely have been available to Kansas during the irrigation seasons in 2005 and 2006, even though the irrigation season is shorter than Book assumed. Indeed, Schneider agreed that he was "confident that the IMP 3 if, for example, it had been employed back in 2006 would have achieved compliance in that [front-loaded] manner." (Tr. at 639 (Special Master).) To the extent "front-loaded" water might have arrived before irrigation season, storage would still likely have rendered it available for irrigation. While Schneider's testimony regarding Nebraska's compliance approach related specifically to the

third generation IMPs, which were not in place in 2005-2006, there is adequate basis for concluding that that compliance approach constitutes a suitable proxy for the manner in which Nebraska might have behaved in 2005 and 2006, if it had taken steps necessary to comply with the Compact. And given Riley's concession that front-loading the compliance would have made up for any other mistakes in Book's calculations (Tr. at 963-64 (Riley)), it is not likely that the fact the irrigation season was shorter than assumed by Book, and that return flow during the irrigation season would be correspondingly less, materially affects Book's analysis.

(iii) Kansas' damage analysis for 2005 is likely inflated by failing to account in some manner for the unusually high amount of precipitation during the 2005 irrigation season in Kansas.

Multiple steps in Kansas' damages analysis, namely, calculation of the required water and calculation of crop yield differential, involve assumptions regarding precipitation amounts, especially during irrigation season. As discussed below, precipitation can affect both the amount of water delivered to farms and the crop yield differential caused by additional irrigation water. Nevertheless, Kansas did not take into consideration available data showing the

actual precipitation that fell in 2005 and 2006 in its damages analysis. Instead, Book considered historical records and concluded, based on past precipitation amounts and delivery amounts, that all of the required water would have been delivered to farmers regardless of the actual precipitation in 2005 and 2006. (Tr. at 164-65 (Book); Tr. at 920 (Riley).) Similarly, another Kansas expert, Dr. Norman Klocke,[48] did not consider actual precipitation in his analysis of crop yield differential; rather, he used a "composite" precipitation amount from the range of years used in a standard model he employed. (Tr. at 1457-58 (Klocke).)

The evidence shows that precipitation in 2005 during irrigation season in Kansas was well above average. The actual average rainfall for June through August was 8.00" for 1994-2000 (a time period that Book designated as "normal"), and 11.09" for 1956-2011. (N6003 at 79 of 88.) In 2005, however, a total of 16.00" fell in the months of June, July, and August. (*Id.*) As Book conceded, this meant that rainfall in 2005 was much greater than average for June through August. (Tr. at 164 (Book).) For the months May-September 2005, precipitation in KBID exceeded the average by 2.5" (K103 at 6.)[49]

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[48] Norman Klocke holds a Ph.D. in Irrigation Engineering and has extensive experience in agricultural and water resources engineering. (Klocke Direct at 3-6.)

[49] In 2006, the precipitation for the months May-September in KBID exceeded the average by only 0.4". (K10 at KS01155.)

The effect of actual precipitation during the irrigation season could well have been to reduce the call for irrigation water. (Riley Direct at ¶ 11; Tr. at 919 (Riley) ("Precipitation can certainly provide for the crop demand.").) Effective precipitation – precipitation that is able to infiltrate the soil and be stored by plants – reduces the need for applied irrigation. (Tr. at 1715-16 (Klocke).) According to one of the Kansas farmers who testified for Kansas, Kenneth Nelson, "precipitation during the irrigation season lessens the demand [for irrigation] or shuts it off." (Tr. at 1070 (Nelson); *see* Tr. at 1087 (Nelson) ("A. In 2011 our base supply was 15. And I think we ended up using around 8 inches in the entire district. Q. And why did you only use 8 out of the 15? A. We had good rainfall.").) While Book takes the position that the rainfall amounts for April through September in 2005 and 2006 were not so high that his calculated delivery and use of required water would be outside the historical practice (K17 at 2), his rationale rests on an erroneous comparison. In making his historical comparison, Book excluded all "water restricted" years. (K17 at 10; Tr. at 921-22 (Riley).) A "water restricted" year is a year in which less than a "full supply" of 15" of irrigation water is available per acre. (Tr. at 193-94 (Book); Tr. at 1520 (Hamilton).) However, the evidence suggests that 2005 and 2006 would have been "water restricted" even if Nebraska had fully complied with the Compact. (Tr. at 1518-21

(Hamilton).)[50] As such, Book has not put forward reliable evidence suggesting that his required water calculations were justifiable, given actual precipitation amounts in the 2005 irrigation season. Nor did Book offer any evidence that the actual precipitation during the 2005 irrigation season, while great in volume, was ineffective in its distribution. In sum, Book's failure to account for the possibility that the large rainfall greatly mitigated any need for irrigation means that he did not consider actual net irrigation requirements. (Tr. at 195-96 (Book).) This failure materially skews his analysis of required water for 2005.

Similarly, properly accounting for material variations in precipitation can affect Klocke's yield analysis. (Tr. at 1457 (Klocke).) Each inch of effective water applied to the plants (whether in the form of precipitation or irrigation water) has a diminishing effect on yield. (Tr. at 1653 (Sunding).) Therefore, if the actual precipitation exceeds the average, then using average precipitation as a baseline can lead to an overstatement of the crop yield differential of additional inches of irrigation water. (Tr. at 1473 (Klocke).) That is to say, where actual rainfall differs materially from the average, it is not possible to

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[50] One might ask how 2005 could have been "water restricted" if so much rain fell during the irrigation season. The answer is that the "water restricted" designation is made based on the amount of stored water available the prior winter. (Tr. at 193-94 (Book).)

accurately determine yield differential based on average precipitation. (Tr. at 1654 (Sunding).) As noted above, the actual rainfall in 2005 during irrigation season was significantly different than the average relied upon by Klocke. Accordingly, because Klocke's yield differential calculation used an average precipitation amount, rather than actual, his yield slope was biased upwards, as established by Nebraska's expert, Dr. David Sunding[51] (Tr. at 1649-53 (Sunding)), and as ultimately conceded by Klocke (Tr. at 1703-04 (Klocke) (conceding that the yield slope changes when precipitation increases)).

As a result, Book's and Klocke's failure to consider actual precipitation tends to make Kansas' 2005 damage analysis insufficiently reliable at two levels.

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[51] David Sunding holds a Ph.D. from the University of California at Berkeley and is Professor of Natural Resources Economics. (Sunding Direct at 1.) He also has extensive experience in agricultural and resource economics. (*Id.* at 1-2.)

(iv) The results of the "crop yield differential" employed by Kansas' experts suggest that Kansas' estimates of the yield reductions caused by Nebraska's overuse are likely inflated for 2005 but otherwise appear within a range of reasonableness.

An essential step in Kansas' damages analysis, performed by Dr. Joel Hamilton[52] and Dr. M. Henry Robison,[53] involved a quantification of the crop yield differential using Klocke's yield analysis. That is, Hamilton and Robison sought to determine the difference between Kansas' model of the crops grown in 2005 and 2006 and its model of the crops that would have been grown had the required water been delivered (the "but-for" model). (Hamilton Direct at 11-12.) Hamilton and Robison used these crop yield numbers to calculate both on-farm direct losses as well as

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[52] Joel Hamilton holds a Ph.D. in Agricultural Economics with a specialty in Econometrics from U.C. Berkeley. (Hamilton Direct at 3.) Hamilton's major research areas include the economics of water resources and regional economics. (*Id.* at 5.) Hamilton has served as an expert witness in two previous interstate water compact cases. (*Id.* at 6-9.)

[53] M. Henry Robison holds a Ph.D. in Economics from the University of Utah, has taught at the University of Idaho, and has extensive experience in applied regional input-output modeling. (Robison Direct at 3-7.)

secondary direct and indirect losses. (Hamilton Direct at 12-13.)

Hamilton used a model of actual conditions in 2005 and 2006 and compared that model to its "but-for" model rather than using reported crop yields because, according to Hamilton, it is methodologically superior to compare two models rather than a model against the real world. In his words, "I relied on the yield model because I think the yield model is better capable of describing a difference in yield resulting from various levels of water application than the alternative, which would have been relying on KBID survey yields and then using a model to predict – to estimate, to calculate yields if the required water had been available." (Tr. at 1503-04 (Hamilton).) According to Hamilton, comparing one model to another model means that any biases would be compensating, and therefore would be cancelled out. (Tr. at 1572-73 (Hamilton).) Hamilton further suggested that survey data may not be reliable – though he did not attempt to determine the reliability of the survey data at issue. (Tr. at 1506-07, 1571 (Hamilton).) For these reasons, and because Kansas was "mainly interested in differences in yield," he concluded that comparing two models "makes good methodological sense, makes good empirical sense compared to – comparing a yield model estimate to survey numbers." (Tr. at 1504 (Hamilton).)

Kansas' experts steadfastly maintained that it was only necessary to establish yield differential,

not actual yield. (Tr. at 1465-66 (Klocke).) As such, Hamilton did not take the next step of adding the yield differential to the survey data to get total yields that could be compared to actual yields in other years as reported in survey data. (Tr. at 1571 (Hamilton).) Nor did he compare actual yield differentials as a comparator for his calculated yield differentials. (Tr. at 1573 (Hamilton).)

Although Kansas' entire analysis is premised on the notion that only yield differentials are important, and not actual yields, Klocke did admit that a yield calculated using the differentials should be "very close" to actual yield. (Tr. at 1469 (Klocke).) It is not readily apparent, however, that Kansas' calculated yield is close to the actual yield.

The report of Nebraska expert Sunding suggests that "yields reported in KBID in 2005 and 2006 are much higher than those that the yield model predicts, sometimes exceeding the yield model's predictions of crop productivity even under an assumption of full irrigation." (N6003 at 6 of 88.) Further, "[i]n many cases the hypothetical yield estimates produced by the model are not close to real-world levels reported by KBID farmers." (*Id.* at 11 of 88.) For instance, Kansas' model for "actual" yield in 2005 produced an estimate that understated the reported yield for corn by 16.79%, overstated the reported yield for milo by 8.9%, overstated the reported yield for soybeans by 2.07%, and understated the reported yield for alfalfa by 34.21%. (*Id.* at 12 of 88.) In 2006, Kansas' model

for "actual" yield in 2006 overstated the reported yield for milo by 19.95%, soybeans by 10.75%, and understated alfalfa by 18.25%. (*Id.*) Kansas' prediction of the "actual" yields for soybeans in 2005 and 2006 exceeded any yields ever reported in KBID up to that point, while the "actual" yields for corn and alfalfa were significantly lower than the average over the prior decade. (*Id.*) Sunding found these variations significant because "the predicted changes in yield from failed water delivery that drive Kansas' estimated damages range from only 1-13%," and traced the faulty yield calculations to the inputs to the yield model. (*Id.* at 12-13 of 88.) So, for instance, Sunding pointed to Kansas' assumed maximum corn yield, which was exceeded by the reported yield in 2005 (and was exceeded by nearly 21% in 2009). (*Id.* at 13 of 88.) According to Sunding, "[t]his is a serious shortcoming of Kansas' yield model as setting a maximum yield under actual observed levels in KBID will consistently lead to the underestimation of corn yields in years with favorable growing conditions, such as 2005." (*Id.*)

Hamilton seemed to concede that his yield differentials led to calculations of actual yield that are too high, but defended the yield differential, in the following colloquy:

> Q. But in – let me ask it this way. In your work over the years in your field, have you encountered situations in which the same acreage farm would from year to

year have variations in yield of this order of magnitude?

A. Well, there will be variations in yield for various external causes. And they may be significant.

Q. But would they be this significant? In other words, have you ever observed with any regularity differentials from year to year in the same acreage of this magnitude?

A. This would be high for a – higher than one would tend to expect with any regularity and variation in annual yield.

Q. And then given that, how do you still reach a comfort level with this figure?

A. Because I'm – I'm comfortable that the approach we used in – is an appropriate way and a way with a high degree of confidence to calculate the yield difference.

Q. Right. And I'm not asking if the 179 figure strikes you as large. I'm asking if the 24 differential figure strikes you as a large differential based on what you have seen happen in fact?

A. I do not think it's a large differential for the effect of irrigation.

(Tr. at 1577-78 (Special Master, Hamilton).) Hamilton also defended his conclusions by pointing out that

his calculated yield differential is favorably comparable to the yield differentials from the National Agricultural Statistics Service ("NASS"). (Tr. at 1597-98 (Hamilton).)[54]

In weighing the competing expert testimony, it is helpful to look at the actual reported yields for recent years to see: how the reported yields for 2005 and 2006 compared to those of other years; and, how those yields for 2005 and 2006 would compare to other years if the yield differential calculated by Kansas were added to the reported yields for 2005 and 2006. The table below sets forth the total of the reported yields and also, for 2005 and 2006, the sum of the reported yields and Kansas' asserted yield increase, drawn from the KBID reports and Kansas' expert report:

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[54] The NASS yield differential data cited by Hamilton were comparisons of the yields in the NASS reports in 2005 and 2006 for irrigated versus non-irrigated crops. (Tr. at 1596-98 (Hamilton).)

Year	Corn	Milo	Soybeans	Alfalfa
2001 (reported)	155.0	92.8	47.7	6.1
2002 (reported)	162.0	102.0	47.0	7.6
2003 (reported)	160.7	124.2	49.9	5.6
2004 (reported)	180.4	134.2	54.8	8.9*
2005 (reported)	187.0	119.7	58.0	7.6
2005 *(reported + calculated differential)*	*211.0*	*123.6*	*61.9*	*8.2*
2006 (reported)	162.6	110.5	54.9	6.3
2006 *(reported + calculated differential)*	*183.7*	*112.7*	*57.7*	*6.9*
2007 (reported)	181.6	126.5	55.2	6.8
2008 (reported)	189.9	118.5	55.0	6.6
2009 (reported)	220.5*	134.7*	64.7*	6.6
2010 (reported)	162.7	103.5	53.7	8.3

* highest reported amount

(*See* N8208 at 6-7; K105 at KS580.) Examination of this table supports Nebraska's view that the actual yields reported for 2005 and 2006 (2005 in particular) do not leap out as outliers pointing to an absence of water relative to the other years. While those other years consist in great part of other years in which Nebraska exceeded its Compact allocation (2003 and

2004, and likely 2001 and 2002), they also include 2007 to 2010, when rain was mostly above average (N8205 at 2; N8206 at 2; N8207 at 2; N8208 at 2) and Nebraska used less than its allocation (N2001 at 12 of 168).

What this chart also makes clear, though, is that the "but-for" yields predicted by adding to the reported yields for 2005 and 2006 the yield increases asserted by Kansas also are not facially implausible outliers. If we accept Kansas' proof regarding the improvements in yield its farmers would have realized had they received the water Kansas was entitled to receive, 2005 would have been the second best year over this period; 2006 only the sixth best, or so. In short, the parties' competing positions each fall entirely within the range of facially plausible outcomes.

It may also not be coincidental that Kansas' projection of yield differential added to the reported actual yield is, on the relative range of this chart, most remarkable for 2005, the year for which Book and Klocke made overly negative assumptions of irrigation season precipitation.

(v) Kansas' experts employ a reasonable approach to estimating the secondary effects of the loss in farm revenues caused by Nebraska's breach.

Out of the $5,126,992 total loss claimed by Kansas, approximately 40.6% ($2,080,553) consists of secondary effects beyond the direct farm loss.[55] (K105 at KS611.) Sometimes referred to as "multiplier effects" (*id.* at KS559), secondary effects are the effects on value added by the suppliers of the farms ("secondary direct loss") and by the suppliers of the suppliers ("secondary indirect loss") (Hamilton Direct at 12). Simply put, if a farmer puts less land into production, the farmer buys less seed, fertilizer, chemicals, etc. Those foregone purchases result in foregone value added to the gross state product. (Hamilton Direct at 12; Robison Direct at 8-9.) Hamilton and Robison utilized the IMPLAN input-output model to calculate these secondary effects. (Hamilton Direct at 12-13; K105 at KS559.)

The original IMPLAN model was developed by the U.S. Forest Service and is now maintained by a private firm, MIG, Inc. (K105 at KS559.) Robison has extensive experience with IMPLAN, having constructed hundreds of IMPLAN models to assess

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[55] The percentage for 2006 is approximately 39% ($986,179 divided by $2,531,611). The percentage for 2005 is approximately 42% ($1,094,374 divided by $2,595,381). (K105 at KS611.)

secondary economic effects for the federal government and various state and local agencies, and constructed the model used in *Kansas v. Colorado*, No. 105 Orig. (Robison Direct at 5-7.) In that case, his use of the model, akin to his use here, was found to be both admissible and persuasive by the Special Master. Special Master's Third Report at 65-71, *Kansas v. Colorado*, No. 105 Orig. (Aug. 31, 2000).

In using the IMPLAN model, Hamilton and Robison relied on "regional purchase coefficients" ("RPCs") to determine how much of the change in spending on produced inputs would have occurred in Kansas. (Robison Direct at 18; K105 at KS559-61; Tr. at 1543-44 (Hamilton).) Kansas' secondary losses are calculated solely based on spending that would have occurred in Kansas. (Robison Direct at 17-18.) The RPCs do not take into account any transborder impact between Kansas and Nebraska. (Tr. at 1543 (Hamilton).) According to Hamilton, "coefficients identify what portions of spending occur within the region," in this case Kansas, but "do not say where the rest is spent." (Tr. at 1543-44 (Hamilton).) While Hamilton acknowledged the concept of interregional spillovers, which "are instances where the economic impact, as it spreads out from its source, actually crosses a regional boundary" (Tr. at 1552 (Hamilton)), Hamilton and Robison concluded that any "spillovers, to the extent that they may exist, were minor" (Tr. at 1555 (Hamilton)). In reaching this conclusion, Hamilton and Robison relied on the "Rand McNally Trading Areas" and the "BEA Economic Areas" from

the U.S. Chamber of Commerce, Bureau of Economic Analysis (K116 at 10-11), which show that "the economic regions tend to separate at the state line" between Kansas and Nebraska (Tr. at 1553 (Hamilton)).

Nebraska, through Sunding, suggests that this analysis overstates Kansas' losses. Sunding makes two principal critiques of Kansas' analysis.

First, he suggests that the IMPLAN model is flawed in that it only distinguishes between spending in Kansas and spending outside Kansas, and does not further distinguish between spending near Kansas (in Nebraska, for instance) and spending further away (such as in California). As Sunding testified,

> [t]he way that Kansas' economists constructed the model, there is Kansas; and then everything outside is a black box. So so-called leakages from Kansas, say purchases by Kansas farmers of inputs that are manufactured somewhere other than Kansas, the way they did it, it doesn't matter whether those inputs are purchased in Nebraska or California; they're just leakages to Kansas. And I think that's a clear error given that this is a border economy.

(Tr. at 1680 (Sunding).) This criticism is neither understandable nor persuasive. The IMPLAN model used by Hamilton and Robison already accounts for (and does not include as value added) spending that would not occur in Kansas. (Robison Direct at 17-18.) Determining where outside of Kansas the spending

occurs would not seem likely to lower Kansas' damage estimate materially.

Second, Sunding argues that Kansas erred in its damages analysis because "the additional economic activity in Nebraska associated with overuse of water will stimulate the economy in Kansas." (N6003 at 37 of 88.) He took the position that "[t]his cross-border effect should be subtracted from any assessment of Kansas damages," and criticized Kansas for "ma[king] no attempt to do so." (*Id.*) Sunding testified that he

> prepared a – I wouldn't characterize it as anything more than an example using IMPLAN itself where I adjusted economic activity in the grain sector in Nebraska and traced through how much of the indirect effects from an increase in grain production in Nebraska flow into Kansas opposed to any other state. And, interestingly, an increase in economic activity in grain farming in Nebraska produces secondary benefits in Kansas that, to a rough degree, cancel out the negative secondary impacts that Kansas is claiming. And that was a matter that clearly should have been taken into account.

(Tr. at 1681 (Sunding).) Based on his "example," Sunding quantified the spillover effect as totaling over $2 million. (N6003 at 37-38 of 88.) In sum, he is claiming that the overuse of water in Nebraska generated increased activity in Nebraska that led to cross border purchases in Kansas generating $2

million in value added that would not have existed had Nebraska not breached the Compact.

The problem with this critique is that while the record contains considerable anecdotal evidence that some Kansas farmers go north to Nebraska to purchase goods (Tr. at 108-09 (Ross); Tr. at 1081-82, 1126-27 (Nelson)), Nebraska offers zero evidence that its farmers go south to shop. Indeed, the fact that some Kansas farmers feel a need to travel north to acquire fertilizer and seed would suggest that those in the north might already be where they need to be. Sunding does assert that Nebraska farmers do cross the border into Kansas to purchase supplies (Tr. at 1681 (Sunding)), relying apparently on exemplar "multi-regional input-output" IMPLAN modeling of economic activity in the grain sector (N6003 at 37-38 of 88; Tr. at 1681 (Sunding)).[56] However, Sunding's modeling is expressly not meant to be a thorough analysis (Tr. at 1681 (Sunding)), and his "multi-regional input-output" methodology, unlike the RPC methodology, has not been peer reviewed and is hampered by lack of necessary data (K116 at 12). Accordingly, in the absence of record evidence regarding relevant trade flows from Nebraska into Kansas,

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[56] Sunding testified that "farmers in Kansas purchase inputs in Nebraska, and *vice versa*" (Tr. at 1681 (Sunding) (emphasis added)), but the only supporting evidence in the record goes to the north-bound trade flow. There is no supporting evidence as to the converse, and thus no real basis on which to conclude that the Kansas experts' failure to account for cross-border flows into Kansas was inappropriate.

there is no compelling reason to reject Kansas' unremarkable and not unprecedented reliance on the "Rand McNally Trading Areas" and the "BEA Economic Areas" for the proposition that increased direct farm income in Nebraska did not likely lead to materially increased secondary effects in Kansas. The IMPLAN modeling approach taken by Hamilton and Robison, with their reliance on RPCs, is the "settled method of choice." (K116 at 12.)

(vi) On the whole, Kansas' loss presentation reasonably estimates, with adjustment, the 2006 loss but does not provide a basis for estimating the 2005 loss.

The foregoing discussion should make clear that trying to calculate the financial harm caused by Nebraska's Compact breach is extremely complex. Sunding offers other suggestions, summarized in Appendix I, for making the analysis more precise, albeit without offering any quantification of that increased precision. And one can imagine more. Even determining, for example, gross rainfall during the irrigation season arguably falls short of the mark. If it came in large bursts, most could be ineffective. (Tr. at 1730-31 (Klocke).) And rain in one area of KBID does not mean rain in another. Moreover, if farmers were not expecting sufficient irrigation water, they might not have planted, leaving the rain to fall on

fallow fields. So perhaps one need interview each farmer. At some point (and the parties may be long past it in this case) the transaction costs of insisting on precision and accuracy will outweigh the marginal refinement obtained.

All that being said, the net effect of Nebraska's criticisms demonstrate that Kansas' loss analysis is over-stated, although not for as many reasons as Nebraska claims. The 2006 damage claim of $2,531,611 need be reduced by 22% to $1,974,657 to account approximately for the reallocation of the Harlan County Lake evaporation.[57] However, Nebraska's remaining critiques of Kansas' damages estimate for 2006 are not sufficiently persuasive to justify further reducing Kansas' damages.

Adjusting Kansas' damage claim for 2005 is not so straightforward because the approximate magnitude of the effect of the overestimation of required water and yields (by failing to account for large amounts of irrigation season rainfall in the 2005 KBID irrigation season) is unclear. To determine an appropriate amount of damages for 2005, I therefore turn to the evidence Nebraska presented from which one might infer the value of water more directly.

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[57] If one also reduces by 22% Book's estimate of 20,183 acre-feet of additional water that should have been delivered to Kansas farms in 2006, one concludes that the missing water that should have been delivered on-farm in 2006 was worth to Kansas $125.43 per acre-foot (in 2012 dollars).

b. Analysis of sale and lease transactions in Kansas

The decision to reject Kansas' loss analysis for 2005 as overstated is made easier by the fact that Nebraska has proffered an alternative approach to placing a value on Kansas' 2005 loss. Nebraska points out that in 2005 and 2006, a fairly comprehensive survey conducted by Kansas State University indicated that irrigated crop land in north central Kansas leased in 2005-2006 for approximately $33.50 on average more than crop land that was not irrigated. (N6003 at 22 of 88.) In 2005, irrigated land leased for $34 more than non-irrigated land. (*Id.*) Given that the average irrigation delivered in KBID was twelve inches per acre (*id.*), one can infer from the 2005 lease price differential an implicit price of $34 for access to one acre-foot of irrigated water in north central Kansas (*id.*).

The average price one would pay for access to water, prospectively, is not necessarily the value that a particular marginal amount of water would turn out to have in a given year. Each year the actual value of irrigation water can vary greatly depending on the amount of affected precipitation during irrigation season. For the Water-Short Year Administration years like 2006, one would expect water to be worth a significant premium above average prices. In Nebraska, for example, average prices inferred from land transactions were on the order of $30 to $40 per acre-foot in 2005 (N6003 at 28 of 88), while (as described below) Nebraska paid approximately $154 per

acre-foot to buy water rights for 2006 (K116 at 3; K82). This suggests that one need be very cautious about using the average price inferred from land transactions as a true proxy for the average price in any given year.

That being said, Nebraska's suggestion that I use the average inferred price for 2005 of $34 per acre-foot as a proxy for the on-farm direct value to the farmer has merit. With the above-average amount of irrigation season rain, it is harder to suggest that there was in 2005 a shortage premium that need be factored in. If precipitation is more favorable than average, then the average rental prices might actually overstate the marginal value of water. (Tr. at 1669 (Sunding).) Given the yield figures shown on the chart in Section VI.F.4.a.(iv), above, use of an average price for incremental water supply in 2005 may be generous to Kansas.

Kansas' experts point out that the publication from which Sunding has obtained the data for generating from land transactions an implied value of irrigation water in KBID contains a warning that the price data constitute "average prices" and that they are "based on survey respondents' estimates of prices as opposed to actual market sales." (Hamilton Direct at 52-53.) "Thus, these data are more appropriate for analyzing trends than for establishing market value or rental rates for specific tracts of farmland." (*Id.*) Sunding, however, is not using the data to value specific lots of land. (Tr. at 1625 (Sunding).) It is fair, nevertheless, to observe that the use of survey data

rather than actual transactional data is cautionary. And, it may well be, as Kansas' experts suggest, that the data may be thin to the extent that most land rentals in KBID are crop-share leases rather than cash rental leases. (Hamilton Direct at 52-53; K116 at 2.) Kansas, however, points to no other transactional data of any type in Kansas that would suggest that the data used by Sunding is materially unreliable. Simply put, if Kansas farmers were indeed willing to pay a lot more than $34 in 2005 on average for irrigated land as compared to non-irrigated land, then I would strongly suspect that Kansas itself would be able to marshal such evidence.

It is true that the price implied by land transactions, even if accurate, reflects only value to the farmer, and thus does not serve as a proxy that includes any off farm, secondary losses to vendors and the like. (Hamilton Direct at 53.) Sunding agrees, and offers the $34 figure as only a proxy for direct farm loss. (Tr. at 1629-30 (Sunding).) Adding a secondary value equal to 73%[58] of the direct farm value results in a total value (in 2005 dollars) to Kansas of $58.82 per acre-foot for the 22,661 acre-feet of water that should have been available to Kansas farmers in 2005. (K5 at 9.)

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[58] $1,094,374 (Kansas' estimate of its secondary losses) divided by $1,501,007 (Kansas' estimate of its direct losses). (K105 at KS611.)

c. Conclusion: Kansas lost approximately $3,700,000.

The following chart summarizes the foregoing conclusions on damages to Kansas calculated using 2012 dollars, per acre-foot of water that should have been delivered to Kansas farms but for Nebraska's breach.

ESTIMATE OF KANSAS LOSS

	Direct On Farm Value Per Acre-Foot That Would Have Been Delivered On Farm	Secondary Value Per Acre-Foot	Total Value Per Acre-Foot	Number Of Acre-Feet That Would Have Been Delivered On Farm	Damages
2005	$44.35	$32.12	$76.47	22,661	$1,732,796[59]
2006	$76.51	$48.92	$125.43	15,743[60]	$1,974,657[61]
TOTAL	-	-	-	38,404	$3,707,453

[59] $1,332,920 (value in 2005 dollars) multiplied by Kansas compounding factor of 1.300. (K105 at KS610.)

[60] Book's 20,183 acre-feet (K5 at 9) reduced by 22% to account for the 22% reduction in gross overuse on account of allocation of Harlan County Lake evaporation.

[61] This figure is also Kansas' 2006 net damage claim ($2,531,611) reduced by 22% to account for the reallocation of Harlan County Lake evaporation. (K105 at KS611.)

In order not to provide this estimate a pretense of precision, I round it off to $3,700,000.

5. Nebraska's Gain

Paralleling the competing presentations on Kansas' loss, the record also contains two types of evidence aimed at gauging the extent of Nebraska's gain from using water in excess of its Compact allotment.

a. Analysis of Kansas' attempt to estimate Nebraska's gain of gross state revenue realized by Nebraska as a result of its breach

Kansas contends that Nebraska realized a net gain of $61,870,319 (2012 dollars) as a result of its breach of the Compact. (K106 at KS629, 665.) To support this conclusion, Kansas relies primarily on an elaborate array of expert testimony akin but not identical to the testimony Kansas employed to calculate Kansas' loss. The foundation for this testimony is a calculation by Kansas expert Book of what uses of water Nebraska would have curtailed had it successfully sought to comply with the Compact. (K12.) Book concluded that in order to have met the 2006 compliance test by reducing CBCU by 70,000 acre-feet combined in 2005 and 2006, Nebraska could not have relied solely on reducing direct diversions of surface water. Rather, Nebraska would have also needed to

reduce the impact of groundwater pumping on stream flow by a total of just under 34,000 acre-feet during 2005 and 2006, combined. (K12 at 2; Book Direct at 36.) Relying on Larson's analysis of groundwater pumping, Book determined that such a reduction in stream flow depletion could have been accomplished by eliminating all pumping during 2005 and 2006 on an average of approximately 110,000 otherwise irrigated acres located in what Nebraska calls the Rapid Response Region. (K12 at 2, 11; K19 at 1.) That is the region in which the nexus between wells and streams is close enough so that one acre-foot of groundwater pumping reduces stream flow by at least 10% of an acre-foot in two years. (Book Direct at 34.)

According to Larson, the elimination of groundwater pumping posed by Book would have deprived Nebraska farmers of roughly 199,000 acre-feet of irrigation water in 2005 and 2006, combined, in order to have reduced consumption as measured by the Compact (reduction of stream flow) by approximately 34,000 acre-feet. (K19 at 2; K12 at 2, 11.) Kansas' experts Hamilton and Robison then attempt to calculate the reduction in farm and vendor incomes that would have resulted from loss of so much irrigation water in 2005 and 2006. (K106.) They conclude that Nebraska's gain in 2005 and 2006 totaled $61,870,319 in 2012 dollars. (K106 at KS665.)

At the outset, this analysis of Nebraska's gain suffers from the same defect present in Kansas' analysis of its loss: it assumes that the size of Nebraska's overuse in 2006 included (more or less) 8,091

acre-feet of evaporation from Harlan County Lake. Reducing the 2006 gain[62] by 22% to account for this error (*see* Section VI.4 above) results in an adjusted total gain in 2006 of $29,328,452, and a total overall gain of $53,598,191 (in 2012 dollars). Also, there appears to be no attempt to account for the offsetting value created by the pumping reductions in the form of delayed consumption reductions in the ensuing years. None of the experts addressed the fact that the reduction in groundwater pumping posed by Book for 2005 and 2006 would have substantially reduced Nebraska's Compact consumption not just in those two years, but also in subsequent years as the delayed impact of the reduction played out over time. (*See* Tr. at 220-21 (Book) (discussing lag effect of groundwater pumping); Tr. at 630-31 (Schneider) (same).) In the "but-for" world posed by Book, as compared to the actual world, Nebraska would have had less water available for irrigation in 2005 and 2006, but more water available for irrigation in subsequent years. No testimony was offered to quantify this effect. This offsetting value is potentially significant.

Nebraska's expert, Sunding, offered only slightly over one page of additional analysis directly critiquing Kansas' proof of Nebraska's gain. (N6003 at 27-28 of 88.) In conclusory terms, he criticized, first, the use of average precipitation assumptions. He offered no

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[62] Kansas asserts that Nebraska's gain in 2006 equaled $37,600,580 in 2012 dollars. (K106 at KS665.)

evidence, though, that actual precipitation in Nebraska in 2005 and 2006 was materially above normal. He criticized, second, reliance on regional yields and acreage averages, but again offered no evidence that such averages were materially unreliable. He challenged, third, Kansas' assumption that water shortages created by the reduced pumping would have been evenly distributed across all produced crops. In theory, that assumption is indeed vulnerable to questioning, as farmers would presumably have directed limited resources to the more valuable crops. Sunding, though, offered no suggestion that the use of such an assumption materially increased the bottom line of Kansas' analysis.

Sunding's critique concerning the crop budget calculations used by Kansas offered a bit more detail. The crop budget represents the farmers' costs on a per acre basis. Kansas used a single budget for all acreage for each crop. (N6003 at 27 of 88.) Sunding notes that the lack of variation resulting from that assumption results in the use of a crop budget for 2006 dry land milo along the border with Kansas in the amount of $124.27 per acre, even though the crop budget for dry land milo just across the border in Kansas was $216.44 per acre. (*Id.*) Sunding did not qualify the overall impact of this anomaly, or offer any evidence that it was anything other than a singular anomaly. Nor did Kansas' expert supply any rejoinder on this point.

Sunding's primary position was that Kansas' overall approach in general was not a reasonable way

within which to determine the value to Nebraska of the extra water that it used as a result of its breach. Rather, Sunding argues that it is more reasonable to ascertain the dollar value of the water by looking at evidence, both direct and indirect, for prices effectively paid for access to water in Nebraska. It is to that evidence that this Report now turns.

b. Analysis of sale and lease transactions in Nebraska

In 2006, Nebraska purchased roughly 23,000 acre-feet of water at an average cost of $154. (K116 at 3; K82.) Overall, between 2006 and 2008 (*i.e.*, including two years that were not years of Water-Short Year Administration), Nebraska spent $18,722,500 to purchase approximately 98,368 acre-feet of water from surface water irrigation districts at an average cost of approximately $190 per acre-foot. (Dunnigan Direct at ¶ 26; N2001 at 31 of 168.) By ensuring that that water was not used to irrigate crops, Nebraska was able to reduce its annual consumptive balance during those years by 51,614 acre-feet. (N2001 at 31 of 168.)[63] In short, it apparently spent approximately $362 per acre-foot of reduced Compact consumption.

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[63] Using an acre-foot of water to irrigate crops does not on average result in an acre-foot of consumption under Compact accounting because some of the water that is not taken up by the plants and does not evaporate returns to the river. Therefore, to reduce Compact consumption by a given amount, on average one

(Continued on following page)

No evidence of water purchases in Nebraska during 2005 was offered. Sunding's approach of inferring water values to the farmer from differential land values suggested a range of $31 to $41 per acre-foot in on-farm value on average. (N6003 at 28 of 88.) A study done in August of 2006 by an economist at the University of Nebraska concluded that the "on-farm cost of reducing consumptive use [was] estimated to average $98 [per acre-foot] in the Republican Basin." (K115 at 2.) No witness explained this 2006 study or shed light on its provenance.

The evidence of these purchases appears ripe with potential for inferring the value of the water taken by Nebraska in violation of the Compact. A price of $362 per acre-foot of reduced Compact consumption times the total exceedance of 70,869 acre-feet would imply a total gain to Nebraska of over $25 million. The parties, however, presented little evidence concerning how the prices were negotiated, what collateral considerations might have been involved, or the like. The few contracts offered into evidence do not even align with the numbers cited in the testimony or the few pieces of correspondence offered. *See* Appendix J at § II. Furthermore, use of a single figure derived from transactions in 2006-2008 to cover 2005 as well may be unwarranted. Even Kansas' analysis suggests that water was worth much less in Nebraska in 2005 than in 2006. (K106 at

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would need to curtail use of surface water for irrigation by a greater amount.

KS663 (assigning a value of less than $20 million to the 42,860 acre-feet of water in 2005 as compared to over $30 million for the assumed 36,800 acre-feet in 2006).) None of the experts attempted to explain how and to what extent one might make such adjustments in order to use these transactions to calculate gain to Nebraska. What is reasonably clear, though, is that however the evidence of these transactions might be used, it certainly suggests that Kansas' estimate is on the high side.

c. Conclusion: Nebraska likely gained very much more than Kansas lost.

The Court can confidently conclude that: an acre-foot of water allocated to Kansas under the Compact was likely worth substantially more per acre-foot on-farm in Nebraska than in Kansas; the amount of water used by Nebraska in excess of its allocation also substantially exceeded the volume of water, net of transit loss, that Kansas lost as a result of Nebraska's breach; and there is no reason to suspect that there were not substantial secondary economic benefits in Nebraska of increased harvests. Nebraska's gain was therefore very much larger than Kansas' loss, likely by more than several multiples. The evidence does not allow a more precise estimate than this. In light of the limited use I make of this

evidence regarding Nebraska's gain, as described below, this additional precision is not necessary.[64]

6. Calculation of an Award

I conclude that the monetary award here should be in the amount of $5.5 million. This amount represents an award for the full amount of Kansas' loss, plus an additional amount of $1.8 million. That additional amount represents a disgorgement of a small portion of the amount by which Nebraska's gain exceeds Kansas' loss. It also likely moves substantially towards turning the actual recovery by Kansas, net of reasonable transaction costs, into an amount that approximates a full recovery for the harm suffered.

Beyond that, for two reasons the Court need not do more in this action.

First, Nebraska's substantial expenditures in 2006-2008 on water to mitigate its noncompliance were not the actions of a party callous to the downstream ramifications of its conduct. Rather, they were the actions of a state that recognized, albeit belatedly, a need to pay greater heed to its Compact obligations. But for these actions, it would be difficult not to order a more substantial disgorgement of any gain (perhaps

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[64] To be sure, the fact that I arrive only at a rough, order of magnitude estimate of Nebraska's gain does not mean that that estimate is unreliable as a matter of common sense or math. *See* Lawrence Weinstein & John A. Adam, *Guesstimation: Solving the World's Problems on the Back of a Cocktail Napkin* (2008).

after receiving further evidence to more precisely gauge that gain).

Second, Nebraska has presented a credible case that it began turning over a new leaf in 2007 and thereafter, planning for compliance with more care and urgency. This is the first judgment of breach against Nebraska under this Compact. Should Nebraska not manage to employ its new IMPs with the efficacy claimed, this Report (if accepted by the Court) should make clear that determination of the extent of disgorgement in an action for a breach occurring after 2007 will be made in the absence of one of the two reasons relied upon for not ordering a higher degree of disgorgement now. In this sense, recognition of the Court's equitable discretion and its flexibility in setting awards in a case such as this should itself serve many of the salutary purposes that Kansas has sought to further in seeking an award in excess of its loss.

7. No Injunctive Relief Is Justified.

The injunction Kansas seeks runs the gamut from an order enjoining further violations, to an order shutting down 302,000 acres of groundwater pumping, to the appointment of a so-called "river master," and to the setting of "preset sanctions." (*See* Petition at 11-12; Kansas' Post-Trial Brief (Corrected) at 52, *Kansas v. Nebraska*, No. 126 Orig. (Sept. 25, 2012) (Dkt. No. 385).) For any form of injunction, the gist of the required showing is that the injunction is needed

in order "to prevent future violations." *United States v. W.T. Grant Co.*, 345 U.S. 629, 633 (1953). "It goes without saying that an injunction is an equitable remedy. It 'is not a remedy which issues as of course.'" *Weinberger v. Romero-Barcelo*, 456 U.S. 305, 311 (1982) (quoting *Harrisonville v. W.S. Dickey Clay Mfg. Co.*, 289 U.S. 334, 337-38 (1933)). "The historic injunctive process was designed to deter, not to punish." *Hecht v. Bowles*, 321 U.S. 321, 329 (1944). Thus, "[a]n injunction should issue only where the intervention of a court of equity 'is essential in order to protect property rights against injuries otherwise irremediable.'" *Romero-Barcelo*, 456 U.S. at 312 (quoting *Cavanaugh v. Looney*, 248 U.S. 453, 456 (1919)).

> According to well-established principles of equity, a plaintiff seeking a permanent injunction must satisfy a four-factor test before a court may grant such relief. A plaintiff must demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.

eBay, Inc. v. MercExchange, LLC, 547 U.S. 388, 391 (2006); *see Romero-Barcelo*, 456 U.S. at 312 ("The Court has repeatedly held that the basis for injunctive relief in the federal courts has always been

irreparable injury and the inadequacy of legal remedies.") Further, while "the court's power to grant injunctive relief survives discontinuance of the illegal conduct," it is well-established that "the moving party must satisfy the court that relief is needed. The necessary determination is that there exists some cognizable danger of recurrent violation, something more than the mere possibility which serves to keep the case alive." *W.T. Grant Co.*, 345 U.S. at 633. *See also Madsen v. Women's Health Ctr., Inc.*, 512 U.S. 753, 756 n.3 (1994).

Kansas seeks to place on Nebraska a burden of disproving the need for injunctive relief, citing *W.T. Grant*, 345 U.S. at 633. (Kansas' Post-Trial Brief (Corrected) at 48, *Kansas v. Nebraska*, No. 126 Orig. (Sept. 25, 2012) (Dkt. No. 385).) That reliance is misplaced. *W.T. Grant* only places the burden of proving mootness on the defendant. *Id.* It simultaneously makes clear that the party seeking an injunction "must satisfy the court that relief is needed" by showing a "cognizable danger of recurrent violation." 345 U.S. at 633.

As discussed in greater detail in Section VI.F.1.c, above, Kansas has not carried its burden of establishing a "cognizable danger of recurrent violation." *Id.* On the whole, the record falls short of establishing that the current IMPs, if followed conscientiously, are not capable of ensuring Nebraska's compliance going forward. Kansas presents no effective response to Nebraska's modeling showing that the current IMPs would have resulted in annual consumption by

Nebraska below its allocations even during 2002-2006. In turn, Kansas' own forward projections of how the IMPs will perform over time are built on incorrect assumptions, and identify no likely breach in its foreseeable future.

Kansas' best argument is its skepticism (born of experience) that Nebraska has the will to use the IMPs to ensure compliance. Not discounting that skepticism entirely, I nevertheless found Nebraska's officials who testified at the hearing credible and earnest in their expression of commitment to complying with the Compact. On the other hand, Kansas is correct that the complexity of Nebraska's relevant governing structure and the absence of a statewide consensus among surface water users and groundwater pumpers pose substantial challenges to the continuous and effective enforcement of the IMPs.

Under the reasoning of this Report, Nebraska's incentive to extend its recent record of strong compliance should be increased by its knowledge that, in the event of a relapse after this date, Nebraska will have a difficult time parrying a request for disgorgement even in the absence of a deliberate breach. In this important respect, recognition of the Court's broad equitable discretion in fashioning a remedy reduces the need for a proscriptive injunction. It is not apparent that an order to comply with the Compact would add anything meaningful to the mix.

As for the more detailed aspects of the injunction Kansas seeks, the Court should require a much

stronger showing of necessity before it begins deciding which wells need to be turned off, and when. Kansas' request for an injunction, at base, rests largely on an assumption that the Compact requires that use of surface water take precedence over use of groundwater. In this manner, the requested injunction would require Nebraska to achieve Compact compliance by reducing only groundwater pumping. Nothing in the Compact itself supports this assumed priority.

Even were injunctive relief otherwise warranted, Kansas' request for the appointment of a river master would prove unsuccessful. The Court has "taken a distinctly jaundiced view of appointing an agent or functionary to implement [its] decrees." *Texas v. New Mexico*, 482 U.S. 124, 134 (1987); *see Vermont v. New York*, 417 U.S. 270, 275 (1974) (noting in rejecting the proposed appointment of a lake master that "it is a rare case where we have appointed a Water Master"). The Court has appointed river masters only "twice before and only because it was convinced that such an appointment would significantly aid resolution of further disputes." *Kansas v. Colorado*, 543 U.S. 86, 92 (2004). The Court has done so only when there is little prospect that the states will be able to cooperate, *Texas v. New Mexico*, 482 U.S. 124, 134 (1987), or where the river master's duties are largely ministerial, *see Vermont v. New York*, 417 U.S. 270, 275-76 (1974) (discussing *New Jersey v. New York*, 347 U.S. 995 (1954)).

There is little doubt that Kansas' proposal for a river master runs afoul of this precedent. Kansas has requested that the river master be empowered "to review decisions of the Nebraska Department of Natural Resources with respect to the need for and sufficiency of actions proposed ruing [sic] 'Compact Call Years' and to oversee and ensure the implementation of such actions." (Kansas' Post-Trial Brief (Corrected) at 75, *Kansas v. Nebraska*, No. 126 Orig. (Sept. 25, 2012) (Dkt. No. 385).) Kansas' witness David Barfield testified that the river master should "be independent of the RRCA," and should be charged with the authority to "review, evaluate, and approve Nebraska's compliance plans during times of inadequate supply." (Tr. at 475-76 (Barfield); *see also* Barfield Direct at 64 (stating that the river master should "determin[e] when conditions warrant additional actions by Nebraska" and "evaluat[e] the sufficiency of Nebraska's actions").)

It is true that, in the Pecos River litigation, the Court appointed a river master where the "apportionment formula [wa]s not entirely mechanical and involve[d] a degree of judgment." *Texas v. New Mexico*, 482 U.S. 124, 134 (1987). In that case, however, the river master's discretion was sharply circumscribed. *See Kansas v. Colorado*, 543 U.S. 86, 93 (2004) (noting that, in *Texas v. New Mexico*, the disputes that would be resolved by the river master would "often prove capable of mechanical resolution and would usually involve marginal calculation adjustments"). Most recently, in *Kansas v. Colorado*,

the Court declined to grant Kansas' request for a river master because "further disputes in the case, while technical, may well require discretionary, policy-oriented decisionmaking directly and importantly related to the underlying legal issues." *Id.* at 92. The same reasoning applies here. As such, it would be inappropriate to appoint a river master.

VII. CONCLUSION

While the extent of Nebraska's breach is subject to the debates addressed in this Report, this action most importantly concerns the subject of remedy. This Report recommends a measured use of the Court's equitable tools in a manner that accounts for the variety of interests implicated in a compact allocating interstate waters, that conforms accounting formulae to the states' shared intentions, that makes Kansas fully whole, that provides adequate incentive for avoiding further breaches, and that at the same time avoids either overshooting the mark or entangling the Court in ongoing supervision of the parties' efforts. In so doing, the issuance of this Report also hopefully provides an occasion on which the states can resolve to proceed forward with greater consensus based on the knowledge that their interests in administering the waters of the Basin will be more aligned.

VIII. RECOMMENDATIONS

For the foregoing reasons, I recommend that the Court rule that:

1. The RRCA Accounting Procedures contain a technical, mutual mistake that should be corrected as specified in Appendix F for Compact accounting years after 2006 so that Nebraska is not charged with the consumption of Imported Water Supply as if it were Virgin Water Supply.

2. One hundred percent of the evaporation from Harlan County Lake during 2006 as calculated under the RRCA Accounting Procedures should be charged to Kansas.

3. One hundred percent of the evaporation from Non-Federal Reservoirs in Nebraska as calculated under the RRCA Accounting Procedures should be charged to Nebraska.

4. Nebraska's liability for its failure to satisfy the two-year running average compliance test in 2006 should be measured by the entire amount by which it exceeded its annual Compact allocations in 2005 and 2006, combined.

5. Kansas' request that Nebraska be found in contempt should be denied.

6. On account of Nebraska's breach of the 1943 Republican River Compact in failing to meet the 2006 compliance test, judgment should be entered against Nebraska and in favor of Kansas in the amount of $5.5 million.

7. All remaining requests for relief, including Kansas' requests for injunctive relief, sanctions, and appointment of a river master, should be denied.

A proposed Decree to this effect is attached to this Report as Appendix A.

Respectfully submitted,

WILLIAM J. KAYATTA, JR.
Circuit Judge
Sitting as Special Master

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November 15, 2013